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IN connection with the action of the St. Paul directors in reducing the dividend on the common stock from a 7 per cent. to a 5 per cent. basis, it may be recalled that during the hearings before the Interstate Commerce Commission early last year in the rate advance case, counsel for the shippers sought to make much of the fact that the road had issued to its stockholders at par the new stock from the proceeds of which it built the Puget Sound extension. Their argument was that the road was distributing undue profits by selling this stock at par when the market price of its old stock at the time was much higher. The Illinois Manufacturers' Association went so far as to publish a special brief on the financing of the Puget Sound Line, in

which some 25 pages were devoted to showing that the road by this action "was deprived of \$122,500,000 as certainly as if it was in the treasury and lost from it." The reply of the railway to this argument was that had the learned counsel for the Manufacturers' association taken the trouble to examine the authorities with the same painstaking care displayed in reviewing the daily quotations on St. Paul stock, they would have found that since the case of Gray v. Portland Bank, decided in 1897, the courts have almost uniformly held, under the common law and when there are no statutes to the contrary that when a corporation increases its capital stock within the limits of its power, each of the existing shareholders has the right to subscribe for and pay for at par a proportionate amount of the increased stock. The Interstate Commerce Commission decided that the railways did not need an advance in rates, and the St. Paul was thereby prevented from getting \$750,000 in increased annual revenue which it had hoped for. There has ensued one of the "lean" years, and the St. Paul's operating income has decreased by \$1,300,000 in the first five months of the fiscal year. The stockholders are now in possession of a 5 per cent. stock quoted slightly above par—at this writing around 108. It may have looked like a melon a year ago; but it now appears that the stockholders simply took their chances like other investors and got no more than they paid for.

IN another column is published a letter from W. W. Cook, general counsel of the Mackay companies, in reply to the editorial comment in the *Railway Age Gazette* of January 19 on his proposal for bringing all the railways of the United States under the control of a \$25,000,000,000 holding company capitalized with guaranteed 3 per cent. stock, and managed by twenty-five directors named by Congress. The editorial expressed grave doubts as to the practicability of securing and continuing in office the most competent men for these enormously responsible directorships. Mr. Cook says in his letter that the selection of the personnel of the directorate, together with the provision of some means for holding them to account or removing them, is but an important detail, and that the objections noted could be overcome in various ways. This detail, in our opinion, is not only important, but vitally important; for on how the directors were chosen would depend what kind of men they would be; and on what kind of men they were would depend the success or failure of Mr. Cook's entire plan. To select the directors by vote of the stockholders would mean simply the substitution of a complete railway monopoly for the present system; while if they were selected by any political body both their selection and their policies would almost necessarily be subject to, if not absolutely determined by, political influences. The doubt expressed in our previous comment might have been extended to the ability of any body of twenty-five men, chosen by any scheme whatever, to manage the 240,000 miles of railway in this country with any greater, or even as great, satisfaction, as is obtained under present methods. Innumerable abuses have been caused by unrestricted competition between separately owned railways. That many and greater evils would result from complete centralization of control seems almost certain. The twenty-five directors Mr. Cook would place in control of the management of our entire vast railway system would be blamed by the public for the real or fancied shortcomings of any and every part of it. The mere fact of such a radical change would raise expectations of a revolutionary improvement in the present methods and results, which would be disappointed; and the board of the holding concern would be subjected to a pressure of conflicting class and sectional demands absolutely dwarfing anything ever experienced by the individual railways. Under separate management the roads are continually charged with favoring particular interests or communities at the expense of others. How much increased and intensified would be these allegations when directed against a single controlling authority, assumed to represent all interests and to have the

power to give each class and section all to which it not only might be entitled, but also all to which it might imagine itself entitled!

A GAIN, the 3 per cent. stock, suggested by Mr. Cook, would naturally attract principally the class of investors who now put their money in savings banks or government bonds, and rest in peace. Without either stress of competition, or the possibility of increased profit, where would be the incentive of the managements of the railways to efficiency? Mr. Cook is a great lawyer, and a recognized authority on corporation law; and his ideas and arguments command respectful consideration. It must be conceded that, as he says, there is a growing tendency toward socialization, not only of the railways, but of other industries. Considered as an ideal, his plan for centralized management presents many features of superior merit as compared with outright government ownership, with the political and other complications which it would involve. As a practical matter, we believe that no plan which will further remove the directors of the railways from direct responsibility to their owners and the public will commend itself, either to those who have a particular interest in the welfare of the railways themselves, or to the so-called "friends of the people." No thoughtful, public-spirited man will try to blind himself to the manifest evils that have prevailed in the past, and which still exist to a reduced extent, under private management. But such men are very far from being convinced that the system of private management has failed. This country is now passing through a transition state in the course of which there is good reason to hope that the major evils of corporate management will be eliminated, while it will also come to be understood that many of the criticisms and complaints against corporations are due to the inherent, ineradicable tendencies of human nature and the natural, inevitable differences of opinion between buyers and sellers, whether the commodity be labor, materials, transportation or securities. The causes of these criticisms and complaints would not be removed by substituting either a gigantic holding company, or the government itself, for the present buyers or sellers, or both. No facts have been adduced or arguments advanced that shake our conviction that the best solution of the railway problem is to be found in private ownership and management under wise, firm, public regulation.

THE cheerless showing of the increase of railway taxation is continued in the returns of the Bureau of Railway Economics for November, 1911. These returns for 90 per cent. of all the steam railways in the country, give for that month an increase of 12.7 per cent. over November, 1910. But, on the other hand, we have some welcome signs that state officials are paying more attention along scientific lines to some of the taxation inequities bearing on steam roads. There was lately held at Boston a conference of state tax officials, some thirty in number and representing the six New England states. Along with other resolutions, the conference adopted one declaring that for purposes of taxation and apportionment of interstate railway values, the "all-track" mileage basis should be taken instead of the miles of line of road. Expressed differently this simply means that if a railway company has double track doing a large business in one state, and in an adjacent state a single track of the same length doing a much smaller business, the values in the two states for purposes of taxation shall not be appraised as equal, but be taken in a ratio of two to one. New England is a section of the country where the railways are old and railway taxation just as old. It is a region where railway taxation ought long ago to have become scientific and standardized. Yet it has taken her tax officials three-quarters of a century to reach so axiomatic a dictum, and now only in the form of a resolution. The actual situation is shown for an example, by the Connecticut law, which for interstate lines imposes taxes by the old "length of line" rule, though excluding from it intrastate branch roads if of less value per mile than one-fourth the average value per

mile of trunk road. For such branch lines inside that state there is a separate valuation. The theory of the conference, however, that trackage is a fairer test of railway traffic and business than length of line, while sound, still leaves room for great disparities. A single track, say 50 miles long, may be doing much more than half the business of double tracks of the same length or, indeed, much less than half.

AN illuminating example of the kind of statistics regarding railway conditions by which the people of the United States are frequently misled, has recently been exposed by H. G. Askew, statistician for the Texas roads. The auditor of the Texas railway commission gave a statement to the newspapers of the population per mile of the leading Texas lines, based on the population of the counties through which they run. This was published with figures giving the population per mile of the larger railway systems of the country. The result was to make the population density of the Texas lines appear very large, by contrast. An average of 600 persons per mile for the Northern Pacific, the Southern Pacific and the Union Pacific, for example, was compared with figures ranging from 491 for the Galveston, Harrisburg & San Antonio to 4,831 for the St. Louis & San Francisco Railway of Texas. Mr. Askew's analysis of these "statistics" showed that the figures for Texas were arrived at by dividing the population of each county by the mileage, not of all the roads in that county, but of each road in it. The population per mile of the Paris & Great Northern, lying entirely within Lamar county, for instance, calculated as 2,748, was obtained by dividing the entire population of Lamar county by 16.94, the entire mileage of the road; and other roads having a larger or smaller mileage in that county were similarly credited with a smaller or larger number of persons per mile, the entire population of each county being used as many times as there were railways in it. Mr. Askew makes the obviously correct suggestion that the accurate method to have used would have been to divide the entire population of a given territory by the entire mileage of railways in it, and shows that, considering the entire population and the entire mileage, there are only about 250 people in Texas for each mile of railway. The statement of the commission conceded that population density is "not always" a correct index of the earning capacity of a road; but as it is often used as such an index, and as the statistics in question evidently were put out to show that Texas is a good field for railways, the tendency, if not the intent, was to mislead.

IF it is not too late to suggest New Year's resolutions, we would call the attention of railway presidents to two excellent subjects which they can safely recommend to their officers and employees, and which afford appropriate material for a large proportion of the employees of any road; and both of these subjects are brought up at this time by the Interstate Commerce Commission. We refer to the fair and honest treatment of other companies' freight cars and the fair and honest treatment of consignees who have been overcharged in their freight bills. Both subjects were dealt with in decisions by the Commission noticed in our issue of December 15, pages 1252 and 1253. They are suitable subjects for good resolutions, because in each of them so much depends on the good will, interest and energy of the individual immediately concerned, rather than on a command from headquarters. The right handling of cars depends on a right spirit in the minds of not only the superintendents and despatchers, but also the conductors and yard masters; and even the brakemen, firemen and "car-knockers." Prompt settlement of overcharges depends not alone on the claim agent and the treasurer, but also on the good will, alertness and intelligent judgment of the station agents and the clerks in stations and at headquarters. However vigilant the officer may be in enforcing obedience to regulations, his success will be only moderate without the real and hearty co-operation of these men in the lower grades. It is too bad that

the Interstate Commerce Commission had to lay down the rule of conduct in these two matters, for the great need of reform in all parts of the country was well known, and the railway men ought to have cured the evil voluntarily. The commission has put in black and white some plain language. Using another road's cars contrary to the owner's known wishes is stealing. To try to justify such practices is to invoke the "law of the jungle," where might makes right. To overcharge on freight is a violation of law. It always was a violation of the law of good business, and to delay reparation not only offends the law, but injures the railway itself. It is true that the carrying out of these sound precepts cannot be made easy. To do justice to one neighbor while still suffering injustice from another will never be wholly pleasant. The path of righteousness, however, is not lined with roses in any part of the United States. The decision of the commission may be a call to arms between you and some of your neighbors. Conventions of railway officers may discuss till doomsday the improvement of the car service rules, but the real problem is to carry out the rules that we already have. The attainment of exact justice in car-interchange will never be possible. The experience of 40 years has taught us that. It behooves the railways to cure these abuses to the extent of their power, for if the task is left to be attended to by the commission or the courts, it will be done according to the inflexible methods, often difficult of application to particular cases, which necessarily characterize the work of a governmental agency.

THE problem of reducing the number of accidents to persons in the operation of railways recently has claimed the attention of railway managements, governmental regulating authorities and the public to an unusual degree. The urgent need for improvement in this respect seems to have become recognized during the past year or two as never before. Many laws have been passed, many safety appliances have been adopted and installed, and many rules representing the best thought and experience of the railway officers as a body have been put into effect in the effort to increase the safety of railway travel and employment. The laws have been inspired by the idea that railway management has been to blame for accidents; the rules by the effort of railway managements to prevent them from being caused by the carelessness or recklessness of employees. Employees comprise the largest class of victims of accidents, except trespassers. Laws, safety appliances and strict operating regulations have failed to bring about the hoped-for improvement. Railway managers have, therefore, begun to give more attention to means of stimulating keener interest and greater activity on the part of employees in the promotion of safety. One of the results has been the development of the safety committee plan, which has now been put into effect by many of the leading railways of the country, and which has already produced an encouraging showing. First worked out by the Illinois Steel Company, this scheme, which from time to time has been briefly described in the *Railway Age Gazette*, was first applied to railway conditions on the Chicago & North Western in 1910. It has since been adopted by the St. Louis & San Francisco, the Baltimore & Ohio, the Delaware, Lackawanna & Western, the Elgin, Joliet & Eastern, the Chicago Great Western and the Chicago, Burlington & Quincy, while several other roads now have it under consideration, or have adopted other plans to the same end. Although some modifications of the scheme have been made in applying it to different railways, in all cases the fundamental principle is to promote co-operation between the employer and the employees in removing the causes of accidents. Wherever safety committees have been appointed employees have been reported as showing a lively interest in their efforts, and many instances have been discovered where both the management and its men were at fault, the former for not providing suitable equipment or conditions, and the latter for failure to use proper care and for laxity in obeying the orders of superiors and the rules of the companies. That the safety com-

mittees have brought about an improvement is indicated by recent reports, showing important reductions in accidents on two of the roads that have had the plan in effect for the longest period of time, although, of course, the improvement may not be due entirely to the work of the committees. On the North Western in eleven months the number of trainmen killed was reduced 47 per cent., and of trainmen injured, 40.8 per cent.; while there was a reduction of 70 per cent. in the number of passengers killed, and of 10 per cent. in passengers injured. On the Frisco, as reported in our news columns this week, there was a decrease of 15 in the number of persons killed and 236 in the number injured in the last six months of 1911, a decrease of 8 per cent. in the total number of casualties as compared with the previous year.

THE SUPREME COURT STILL REVIEWS EVIDENCE.

IF one were to take certain extracts from a recent case decided by the Supreme Court by themselves, ignoring their connection with the rest of the opinion, it would appear as if the court had ruled definitely that the findings of the Interstate Commerce Commission as to facts were not reviewable by the courts, but the full opinion does not corroborate this.

The case is one in which the Supreme Court refuses to grant an injunction against the Interstate Commerce Commission's reduction of rates on fir lumber from the Pacific coast to St. Paul, Minn., which had been advanced by the railways. The opinion of the court, which is by Justice Lamar, says: "In this case the commission had before it many witnesses and volumes of reports, statistics and estimates. . . . There was evidence as to the value of the road, the amounts expended in betterments and paid out in dividends. . . . With that sort of evidence before them, rate experts of acknowledged ability and fairness, and each acting independently of the other, may not have reached identically the same conclusion. . . . Still there was in this mass of facts that out of which experts could have named a rate. The law makes the commission's finding on such facts conclusive."

Such a ruling taken by itself would appear to contradict flatly the decision of the Supreme Court in what was known as the Portland Gateway Case. In that case the commission, after having had full evidence submitted to it, decided on the facts presented that the Northern Pacific did not itself furnish a satisfactory through route to Portland, and that the Union Pacific should be allowed and compelled to furnish a through route to Portland. The Supreme Court overruled this decision, finding on the same facts that the route furnished by the Northern Pacific was satisfactory. The opinion in the present lumber case as a whole, however, does not give evidence that the Supreme Court has changed in any way its attitude toward the powers and authority of the Interstate Commerce Commission. What the court actually does is to say that in this particular case the findings of the commission are not unreasonable and are not proved to be unreasonable. Since, then, the statutes creating the commission give the findings of the commission *prima facie* validity, the Supreme Court will refuse to overrule the commission without more evidence than was presented in this case.

The position of the Supreme Court in a way parallels the position of a judge sitting in a case that is being tried before a jury. Ordinarily, the judge rules on questions of law and leaves the jury to pass on questions of fact; but should the evidence strongly tend one way or the other, the judge may instruct the jury to find for or against the defendant; or, should the jury bring in a verdict plainly against the weight of the evidence, the judge reserves the power to set aside such a verdict. This is just about the attitude of the Supreme Court in the lumber case. The court inquires whether or not the evidence submitted to the commission was ample and whether or not the ruling of the commission was plainly against the weight of this evidence; but, failing to find the commission's order plainly against the weight of the evidence, it will not interfere with the order. Justice Lamar concludes his opinion by saying: "Considering the

case as a whole, we cannot say that the order was made because of the effect of the advance on the lumber industry, nor because of a mistake of law as to presumptions arising from the long continuance of the low rate when the carrier was earning dividends, nor that there was no evidence to support the finding. If so, the commission acted within its power, and, in view of the statute, its lawful orders cannot be enjoined." In other words, the decision of the Supreme Court is a negative one; it gives no more finality to the orders of the commission than they were always presumed to have.

ECONOMICAL OIL-BURNING ON LOCOMOTIVES.

THE use of fuel oil for locomotives was confined until recently to the lines in or near the oil-producing fields, but on the Pacific coast it has extended to other and remote regions where coal is expensive. In 1910 over fifty million barrels of California oil were used for fuel purposes, oil practically displacing coal as railway, steamship and manufacturing fuel on the Pacific coast. In the same year the consumption of fuel oil by locomotives in the United States was nearly 24 million barrels. This is equivalent in heat value to six million tons of coal, or about 4 per cent. of the total coal consumed by locomotives in this country. The rate of combustion on large simple locomotives is 6 gal. of oil per minute, and on Mallet compounds 10 gal. per minute. The latter rate is equal to 14.3 barrels per hour, which, at 60 cents per barrel, represents an expenditure of \$8.58 per engine hour for fuel. When oil is transported a considerable distance the cost is \$1 per barrel, and the expense for fuel per hour proportionately larger.

While oil is regarded as a cheap fuel, this is largely due to the fact that it is used in regions where coal is unusually expensive, and much of the economy attending its use on locomotives is due to matters apart from the evaporation of water. There is less weight for a given heat value, one pound of oil being equal to 1½ lbs. of coal, and the cost of handling oil from cars to engines is decreased; there is no loss by depreciation in this handling or in storage, as there is with coal.

Oil fuel permits of increased mileage per engine, as there is no loss of time in cleaning fires, and the oil capacity of the tender may be 1½ times that for coal; as the work of the fireman is lighter, longer runs are easily possible. All these advantages attending the employment of oil fuel have so favored its use on locomotives that comparatively little attention has been given to its economical use in evaporating water. While tests usually show more than 1½ times the evaporation per pound of oil compared with the same amount of coal, it is certain that this advantage is not fully realized in regular locomotive performance. This is due to several reasons, principally to lack of care on the part of the engineer and fireman, and to the inefficiency of the oil burner. In firing coal the physical limitations of the fireman so control steam production that the cut-off and throttle are regulated to this rate. With oil fuel it is easily possible to make up time by forcing the boiler so that a longer cut-off can be used and the steam consumption is not then economical. This method of operation results also in an excessive and wasteful use of oil.

The instructions to enginemen in handling oil-burning locomotives say that the firing of oil differs very materially from the firing of coal and requires more care to make the combustion of oil fuel economical. The fireman and engineman should work in harmony, and when there is a change in the throttle or reverse lever the fireman should regulate the oil supply to suit the new conditions. In doing this he must exercise skill and be alert, for he can, by a little carelessness, waste more valuable fuel than would be possible on a coal-burning engine. For this reason it is difficult to give arbitrary instructions as to the regulation of the steam and oil supply to the atomizer, the adjustment of dampers or the temperature of the oil in the tender. These details must be left to the intelligence of the engine crew, and their experience must dictate the manipulation of the apparatus to suit the constantly changing conditions of locomotive opera-

tion. Experience has shown that proper care is not usually exercised by enginemen in the discharge of these duties connected with economical oil-burning, and a good measure of proper manipulation is the extent of the production of black smoke, although this is not always the attendant of a lack of economy.

The usual method in stationary boiler practice in oil burning is to turn on the oil until there is just a slight indication of smoke, and it is then known that there is a sufficient flow of oil. With the strong draft in the locomotive and an insufficient oil supply, an excess of air will flow through the furnace and tubes, tending to cool the surfaces, and there is again a loss in economy.

As a result of the excessive use of oil or the lack of sufficient air supply, the tubes become coated with soot and it is necessary to clean them at frequent intervals by a sand blast, which, though a very simple device, is quite effective. The fact that this operation is continually necessary would indicate that soot is constantly forming on the tubes and that they are badly coated when the sanding period arrives. The average covering of soot, which is the normal condition of the tubes of oil-burning locomotives is sufficient to interfere with the efficient transmission of heat from the hot gases through the tube wall to the water. The hot gas must, therefore, escape at a high temperature and the rate of evaporation per pound of oil is low compared with that resulting from proper combustion and clean tubes.

There is little prospect that the enginemen, especially the firemen, will materially improve this condition, as it involves a degree of constant vigilance and personal interest in the work such as is not often obtained from the average workman. Some attention should, therefore, be given to improvements in the burner and the process of combustion which will secure an automatic regulation of the oil and air supply so that it is not entirely dependent on the work of the fireman.

The required fuel supply in a locomotive is closely related to the intensity of the draft. The draft pressure could, therefore, be utilized as a means for obtaining the desired regulation. With the ordinary locomotive oil-burner the liquid is atomized by a steam blast, and when properly adjusted the oil is divided into a fine spray, but if there is a surplus feed numerous drops of oil are driven along with the blast, and there is not an adjacent supply of air for their combustion. It is even difficult to regulate and direct the air supply for the proper combustion of the oil which is completely atomized, and there is frequently a flow of gas through the tubes which is surcharged with carbon and tarry products which gradually deposit on the tubes in the form of soot. Such conditions cannot be regarded as satisfactory for economical oil-burning and the burner and the method of air supply should take its share of blame. In the search for some improvement in the method of oil-burning for fuel something can be learned from the practice in burning liquid fuel in automobiles and gas-burning in gas engines. In this practice there is found the automatic regulation, which is desirable, and should, if possible, be applied to oil-burning locomotives.

In the automobile there is a more frequent change of load on the engines than with the locomotive, and it is not necessary to constantly regulate the flow of both air and gasoline. There is a frequent adjustment of the liquid, but by the use of a carbureter the air supply is made automatic by its connection to the vacuum produced by the pistons of the engine. By this means also there is a more intimate mixture of the air and liquid fuel at the carbureter, and it enters the cylinder more in the form of a gas which is in good condition for complete and economical combustion. It is probable that the extensive and growing use of oil for locomotive fuel will have a tendency to raise the price of oil to such a point that the present wasteful methods cannot be continued, and this will stimulate invention in the direction we have indicated. If this is not done and the price of oil becomes too high for locomotive use under present conditions it will have another effect which has been suggested by motive power officers, and that is the utilization of water power in the western mountain regions and its application to electric locomotives.

THE LABOR SITUATION ON THE RAILWAYS—I.

THERE is vital need for better co-operation between the managements and the employees of the railways of the United States. It is necessary to further the best interests of the railways, the employees and the public; and it should relate to numerous and varied matters. More true co-operation could and would so promote efficiency in many ways as to benefit all. It would improve the quality and reduce the cost of transportation. It would reduce accidents. It would often prevent needless and indefensible strikes, such as that from which the Illinois Central, the Harriman Lines and their former shop employees have been suffering for some months—the employees, however, much more than the roads.

That there is want of proper co-operation between the railways and their employees is recognized by every person who is familiar with transportation affairs. The *Railway Age Gazette* believes that frank and full discussion of the situation would bring about a better condition. It is our intention, therefore, to publish several editorials on the railway labor situation, of which this is the first. We hope that they will call forth frank and helpful expressions from both thoughtful railway men and thoughtful employees.

For the existing unsatisfactory relations between managements and employees there have been a number of causes. One of the principal of these has been the great increase in the size of railways systems within the last ten or fifteen years. Another has been the changes in the control, in the official personnel and in the methods of operation of many roads, which often have been incidental to the process of railway consolidation, but occasionally have occurred independently of it.

The increase in the size of railway systems has made it hard or impossible for the higher officers to know, or keep in touch with, many employees. The subordinate officers, because of too highly centralized managements, have often been unable to deal with employees in the spirit and way that their intimate knowledge of the employees' sentiments and needs made them think was desirable. Then, in many cases, as a result of changes of control, officers who had grown up with the roads, who knew and were known to the employees and commanded a spirit of loyalty, have been supplanted by officers imported from other roads. These developments alone have been sufficient to reduce the amount of sympathy and co-operation between railway managements and employees on many lines. There are some railways, large and small, in the country on which such developments have not taken place—which over a long period of years have remained under the same control and have been officered by men trained up on them—and it will, we believe, usually be found that there is more *esprit de corps* and more true co-operation on them than on other lines.

While these changes in railway control and management have been going on, the brotherhoods of employees have been waxing, both numerically and in the perfection of their organization and the skill of their leadership. The natural result of the development and activities of the labor unions has been to cause employees to look to them and their leaders more and more to get them higher wages and easier working conditions; and each addition to their loyalty to the union has been accompanied by a subtraction from their loyalty to the companies and their managers. The organization and growth of the railway brotherhoods was inevitable. It was a natural outcome of the conditions of modern industry. It cannot be doubted, however, that the changes in the control and in the official personnel of many railways, and the movement toward consolidation into large systems, have tended to stimulate the growth of the unions and to increase their influence and that of their leaders.

Thus the tendencies of railway development on the one hand, and of union development on the other, have segregated the managements and the employees, and in some cases have even made so wide a breach as to reduce co-operation between them to a matter of mere perfunctory routine.

There have been numerous other causes of the existing labor

situation on the railways. Perhaps the most important of all has been the growing "social unrest" which has not been confined to the railway industry, nor to industry in the United States, but has been, and is, profoundly affecting industrial and political conditions throughout the civilized world. Probably the working classes in civilized countries are now receiving higher wages and enjoy more favorable conditions of employment than ever before. This is unquestionably the case in the United States. It is most conspicuously true of the railway employees of the United States. The fact that the economic and social conditions of the railway employees of this country is probably, on the whole, better than that of any other working men in the world, while, generally speaking, the co-operation between them and their employers probably is no more satisfactory than that between employers and employees in general, indicates that the "social unrest" is not chiefly, or even perhaps largely, a resultant of any specific economic and social conditions, but is simply due to discontent on the part of working people with the present organization of industry and society—a discontent which is, perhaps, less a result of conditions actually affecting working people than of socialistic agitation, the words "socialistic agitation" being used here in no bad sense. This unrest and ferment is, perhaps, chiefly a protest of peoples who have achieved democracy in politics against a highly undemocratic form of industrial organization and management. The railway owners, managers and railway employees are face to face with the same problem that confronts employers and employees all over the civilized world—that of adjusting themselves to changed industrial conditions and to changed ideas regarding the proper relations between railway employers and employees cannot be restored.

There is no prospect of a disintegration of our large railway systems into the small railways which have been united to form them. There is equally little prospect of a dissolution of the railway brotherhoods. In other words, the old relationships between railway employers and employees cannot be restored. But there is no insuperable obstacle to the formation of new relations between them under which there can be brought about the co-operation which their interests and those of the public require. Whether such relations shall be brought about probably will depend mainly on how patiently and perseveringly managers and employees try to work out the principles according to which they can co-operate to the best mutual advantage, and strive to understand and respect each other's rights and to perform their duties to themselves, to each other and to the public.

NEW BOOKS.

Prevention of Railroad Accidents. By George Bradshaw. New York: N. W. Henley Publishing Co. Paper, 173 pages, 4½ in. x 6½ in. Price 50 cents; 100 copies, 35 cents each; 1,000 copies, 25 cents each.

This is a book of exceptional merit. The author has served in the claim department of the New York Central for a number of years, and his admonitions to railway men in regard to protecting themselves and their fellow employees from danger, are not only based on the lessons of actual experience, but are set forth in clear and vigorous language. The main body of the work is much like that of Mr. Richards, of the Chicago & North Western, whose papers and addresses on this subject are familiar to the readers of the *Railway Age Gazette*. Indeed, Mr. Bradshaw uses some of the North Western's pictures. Besides this, he has pictures showing the dangers that beset men in shops and in railway yards like those which have been published by the New York Museum of Safety, and also some from the publications of the Bureau of Explosives, showing how to stow dangerous articles in freight cars. Much of the matter in the book has been used by Mr. Bradshaw in addresses delivered at large meetings of the employees of the New York Central. There are nearly 70 illustrations altogether. Numerous admonitions for trainmen and station men are printed in the back part of the book in large, full face type.

Letters to the Editor.

THE ODESSA WRECK.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

Referring to the sentence "Although the car had wooden inside finish which was badly splintered, no fire occurred; and this must be attributed to the use of steam heating and electric lighting, which do not require live flame in the light or live coal in the heater as in the old style methods," in the article "The Steel Passenger Cars in the Odessa Wreck on the St. Paul," which was published on page 85 of your issue of January 19:

I have read everything that I have seen, or that has been brought to my notice, on the subject of fires in railway wrecks; but I have yet to learn of one instance wherein the "old style" method, Pintsch gas, has been responsible for, or contributed toward, conflagration in railway accidents.

MECHANICAL ENGINEER.

[The exceptions of "Mechanical Engineer" are well taken. The comments of the *Railway Age Gazette* were such as to produce an impression that was not intended. The fact is that the reference to "live flame in the light or live coal in the heater as in the old style methods," was meant to apply only to stoves and to oil lights, as, indeed, it was thought would be clear from the use of the qualifying words "old style methods." There are safe methods of lighting besides electric lighting; and those methods cannot be included under the description "old style," for they are in widespread use at the present time. As a matter of fact, the cars in the wreck on the St. Paul were equipped with both Pintsch gas and electric light.—EDITOR.]

D. A. D. AND THE SUPPLY DEPARTMENT.

New York, January 16, 1912.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

In reading "D. A. D.'s" remarks we cannot but be impressed with the fact that he knows a whole lot, but there is a great deal that he knows that he does not impart, as it would not be an argument in favor of his position. He knows full well that a master mechanic is, or should be, a mechanic; and a roadway engineer is, or should be, an engineer. Their training is deficient in the matter of handling or caring for material, however well they may know the character of the material; or, in other words, its composition and uses.

The improvements made in storekeeping methods, and when I say this I mean the handling and care of material, have been brought about by material men, and not by mechanics or engineers.

The material men had a platform on which to build their structure, but before they commenced to build they were obliged to get rid of the debris of the mechanical and engineering departments that had accumulated for years. This debris consisted of old tumbled down storehouses, shanties for oil houses, and in some places no storage whatever; the only protection the oil had was the barrels that contained it, and in some places the earth was so soaked with oil that it is surprising that the people on the other side of the earth have not drilled for oil. Any pensioner or old employee could be a storekeeper; he was employed to act, not to think; material was charged to operation as fast as received from the purchasing agent, expenses were pro-rated so that nothing definite was accomplished. The storekeeper was the joke of the other departments; in fact, he was looked upon as a necessary evil.

"D. A. D." would not go back to those conditions, and if he is fair, which I think he is, he will certainly have to give credit where credit is due.

PROGRESSIVE.

A PLAN FOR CHANGING RAILWAY CONTROL.

New York, January 23, 1912.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

I appreciate the clearness and accuracy of the synopsis, in your issue of January 19, of my plan for a railway holding company, as published in *McClure's* for January, and I am also glad to read your criticisms. But are you not going rather far in saying the plan will not appeal to many public or business men, because the original twenty-five directors, or their successors, might be incompetent or subject to political influences, and because no way is provided for calling them to account and removing them? I am aware that the selection and continuity of these men is a very important detail, but it is a detail nevertheless, and one which can be worked out in various ways. The main features of the plan—its feasibility, legality, and financial soundness—I am pleased to see are not questioned by you.

Turning to your criticisms, if the twenty-five original directors named in the charter were not experienced and first-class men, the charter would not pass Congress and would not be signed by the President. Absolute incompetency will always wreck the finest plan of organization. In the case of this proposed charter, however, where the first twenty-five directors would be named, public opinion would be centered on it and proper men would be selected.

Your objection to the self-perpetuating feature of the board and to the necessity of someone being able to call them to account is more serious. Here too, however, the danger may easily be guarded against in a number of ways, as, for instance, requiring a certain number of new directors each year (as in the old charter of the Bank of England); or requiring the approval of the Interstate Commerce Commission as well as of the President and United States Senate in the selection of the new directors; or even giving limited voting power to the stockholders, as is given today in the Bank of England. There are various devices available in corporation law to meet such contingencies, the simplest being the infusion of new blood each year. Our best men would be glad to serve in such a gigantic public interest, just as all lawyers covet a seat in the Supreme Court of the United States, and just as all Englishmen covet a seat in Parliament.

So, also, as to removing an incompetent or dishonest director. There are various ways of doing this. There is the "recall," as suggested in my article, and that recall might be by the President and Senate, or by the Interstate Commerce Commission, or by the stockholders, and could be made as summary as wished. Or they could be rotated out of office, just as happens in all corporations. That also is a minor detail.

It seems to me that all of your objections apply with much greater force to the personnel under government ownership than to the personnel of a board of directors of a regularly organized corporation. I know you are very conservative, but look at the signs of the times. Postmaster-General Hitchcock's proposition that the government take over the telegraphs will apply to the railways next. It is coming unless something is done to avoid it. My plan is for the purpose of keeping our industries and property out of the hands of politicians, and I believe it will do it. "Better be alarmed by the midnight bell, than be burned in your bed."

I write you because I have been a subscriber to and read your journal carefully for some twenty-odd years last past. I gathered many of my facts and figures from it, and I value highly your opinion.

WILLIAM W. COOK,

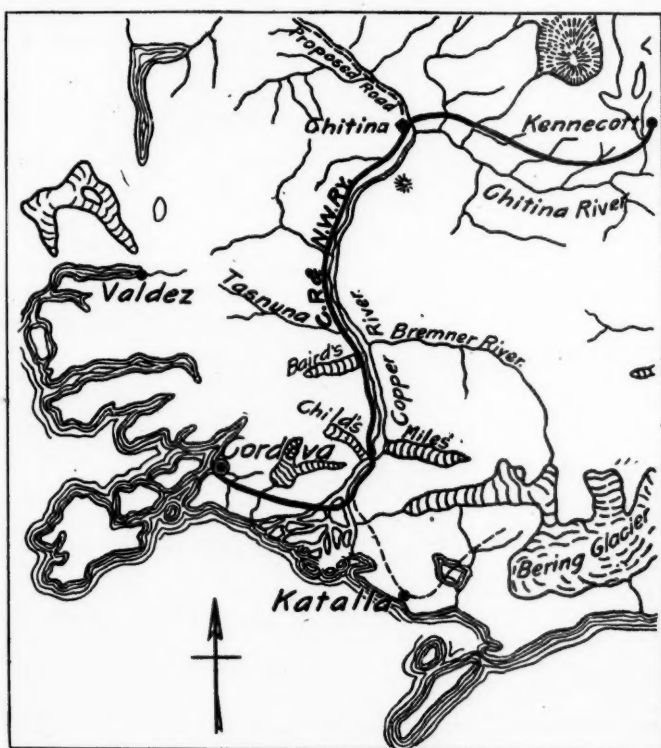
General Counsel, Mackay Companies.

The public works committee of New South Wales does not favor the construction of the proposed railway from Perthville to Burruga, as referred by the legislative assembly, but recommends that the line be built from Tarana towards Burruga via Oberon.

CONSTRUCTION OF THE COPPER RIVER & NORTHWESTERN.

The discovery of coal in the territory surrounding Fairbanks, Alaska, near the head of Matanuska river, and in the vicinity of Katalla, and of copper along the Chitina river, made very desirable the building of a railway into the interior of Alaska from some convenient harbor on the southern coast. The obstacles to building such a line were so great, however, that several unsuccessful attempts were made before the present line of the Copper River & Northwestern Railway was determined on. The Chugach mountains parallel the southern coast about 50 miles inland, rising to an altitude of from 5,000 to 8,000 ft., with innumerable spurs projecting to the ocean, which form an irregular, broken country with many glaciers. The principal problem in locating a railway to reach inland was to secure a crossing of this mountain range. The gorge in this range, which has been cut by the Copper river, is practically the only pass through these mountains, and it is along this river that the final location was made.

The Katalla Company first began work on a railway having a sea terminus at Katalla on the eastern edge of the flats at the



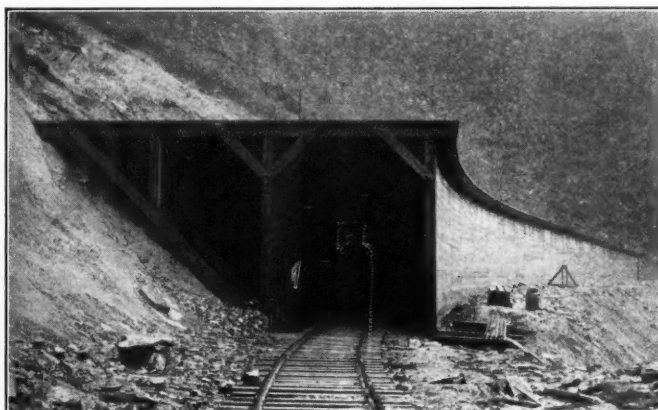
Copper River & Northwestern.

mouth of the Copper river. Work had to be abandoned here, however, on account of the uncertainty of the shore line and a new project was started by the same company at Valdez, at the head of Prince William Sound, but this was also unsuccessful, as the crossing of the mountains at this point was too difficult. In the meantime, work was begun on the construction of the Copper River Railway, beginning at a small village, which is now in the limits of the new town of Cordova, on another arm of Prince William Sound. Five or six miles of this line had been completed when a consolidation of all the interests in this vicinity was effected under the name of the Copper River & Northwestern. The location of the original Copper River Railway was altered somewhat after careful study, but the original plan of that company to follow the Copper river was carried out in the building of the new road. The first work on the new project was done in the spring of 1908, the main line to Chitina was turned over to the operating department in September, 1910,

and the first load of copper from the mines at the end of the Chitina branch line reached the coast in April, 1911.

MAIN LINE.

From Cordova the line runs approximately southeast across the Copper river flats to the west channel of the river, which is crossed by a steel bridge known as the Flag Point bridge. After crossing this channel the line swings northward for a distance of 6 miles on Long Island, which is between the two channels of



Snow Shed at Mile Post 54.

the river, and then crosses again to the west bank by the Hot Cake Channel bridge. From this crossing the line continues up the west bank of the river for about 15 miles, where it is necessary to make a third crossing in order to avoid Miles glacier. For several miles beyond this crossing the line lies in a deep canyon cut by the river, necessitating heavy rock work and more than 2,000 ft. of snow sheds as a protection against the frequent heavy snow slides. For the last 80 miles of the 131-mile line to



Side Hill Work at Mile Post 134.

the new town of Chitina, the road runs through the gorge of the Copper river, which has wide, sandy flats at the junction of the larger lateral streams, but for a considerable portion of the distance is a deep, U-shaped glacial valley with abrupt slopes from 4,000 to 7,000 ft. high. For the last 45 miles of this distance there was continuous heavy rock work, the cost of a portion of this section exceeding \$200,000 a mile.

On the 131 miles from Cordova to Chitina the maximum

northbound grade is .51 per cent., and the maximum southbound is .61 per cent. The maximum curvature per mile is 329 deg., the average curvature 31 deg. 15 min. The total tunnel length is 2,975 ft. divided among 9 tunnels. The total steel bridge work is 4,010 ft. divided among 16 bridges, and the total trestle length is 57,289 ft. The road is standard gage, and is laid with 70-lb. rail, 2,880 ties to the mile.

The tidewater terminus is one-half mile north of Cordova on the east shore of Cordova Bay, where there is a large land-locked harbor, affording ample facilities for commerce at all stages of water. The company's wharf is 738 ft. long and 80 ft. wide, built on creosoted piles and equipped with three large warehouses, loading tracks and derrick for unloading from ship to car. The company's yards, offices, shops and roundhouse are located just south of Cordova, about 2 miles from the terminus. The first 49 miles of the line over the delta of the Copper river contains more than 100 wooden trestles, some of considerable length, as in this flat area it was absolutely necessary to provide

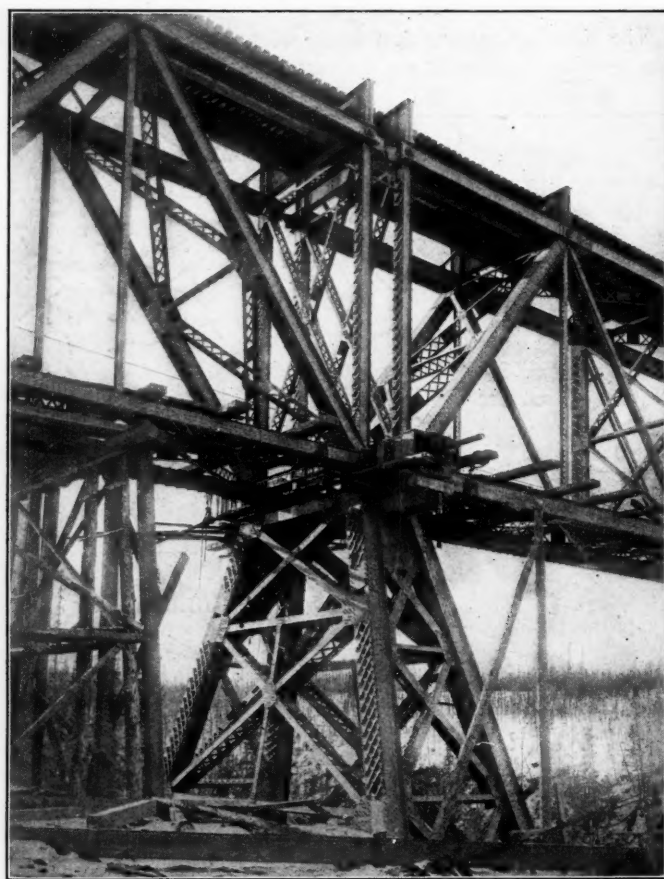
muck supports an infinite variety of plant life. The soil is almost undrainable, and if the upper surface of the muck is removed a new layer begins to thaw and the condition is not improved. In the worst places the ties were laid directly on the ground, and if the muck became too soft a bedding of spruce branches was laid, and the roadbed built up with gravel to a thickness equal to the penetrating power of the sun during the summer months. This insures the freezing of the original surface muck and prevents its thawing, which produces a stable roadbed.

The two principal structures on this branch line are across the Copper river near the point where the branch line leaves the main line beyond Chitina and across the Kuskulana gorge. The former crossing was made on a temporary trestle 2,790 ft. long, which will be replaced later by a steel structure.

Owing to the fact that the railway is not allowed to work the coal fields along the line, its locomotives are operated with oil which is brought to Alaska by steamer from the California



Driving Sheet Piling for Pier at Flag Point Bridge.



Details of Tower of Kuskulana Bridge.

ample waterways for the flow waters which cover the delta during the spring thaws.

CHITINA BRANCH.

A branch line from Chitina eastward along the Chitina river was built to serve the copper and coal belt along the Wrangell range. This branch is about 70 miles long, its extreme point being 195 miles from Cordova. The track standards are lighter than on the main line, the rail being 60 lbs., and tie spacing 2,640 per mile. The maximum grade eastbound is 3.4 per cent., and westbound 1.8 per cent. The climatic conditions in this region are the same as those in the central portion of Alaska, being removed from the modifying influence of the ocean. The principal difficulty in railway building results from the frozen soil, which consists of vegetable matter known as "tundra." This frozen sub-soil produces luxuriant vegetation, as it contains an unfailing supply of water, and during the warm season the rich

oil fields. Daily freight service is maintained to Kennicott and passenger trains meet all steamers.

The traffic to be handled by the present line will be wholly mineral. The Bonanza mine now in operation at Kennicott furnishes a high grade copper ore, while other properties adjacent propose to begin operation in the near future. The line traverses heavy mineralized districts all along its route beyond the first 25 miles. Very good showings of both gold quartz and copper are found. The proposed extension to Chitina will open up a very good agricultural country. There are 200,000 acres in the Tanana valley which can be developed for the raising of hay, grain, potatoes and vegetables, which products are in great demand in the adjacent mining camps. This extension will also furnish a direct outlet from Fairbanks to the coast, the present routes being via the Yukon to St. Michaels or by way of White Horse.

FLAG POINT BRIDGE.

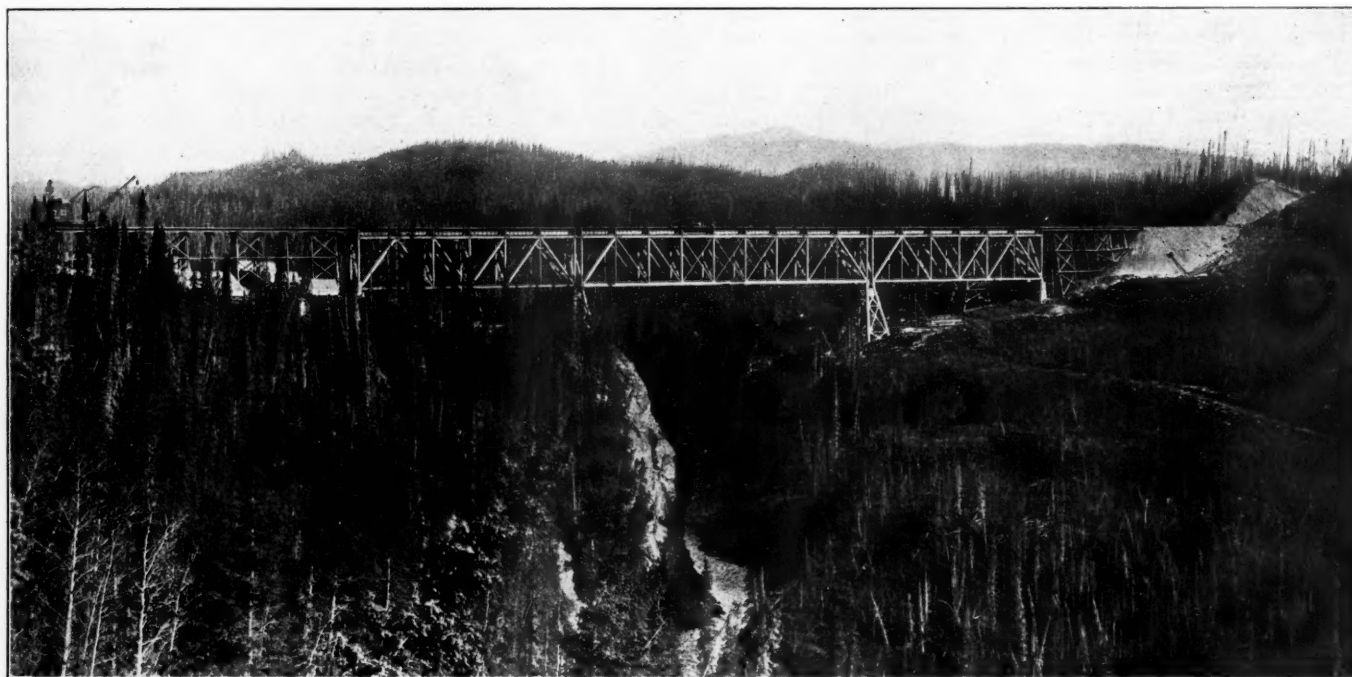
The first crossing of the Copper river is on a structure consisting of nine steel spans, having a total length of 1,860 ft., and supported on concrete piers and abutments. The bridge is divided into three sections separated by a pile trestle and a small island. The first division consists of one 300-ft. pin-connected Baltimore truss and two 150-ft. through riveted trusses; the second section of four 175-ft. through pin-connected spans, and the third section of one 300-ft. and one 260-ft. through pin-connected Baltimore trusses. To carry traffic during the erection of the bridge and to facilitate construction work on the piers a temporary trestle was driven 27 ft. down stream and parallel to the bridge alignment. The two 300-ft. spans and the 260-ft. span were erected on false work by a traveler, and the other spans by a bridge erection car. The concrete was a 1:2:4 mixture in the body of the piers and abutments and 1:1:1 in bridge seats.

The piers and abutments are founded on piles. As it was discovered in driving the piles for the temporary trestle that it was difficult to secure a penetration of more than 10 ft., two 2-in. water jets were used in sinking the piles for the masonry foundations. One of these was placed on each side of the pile,

rails were spiked longitudinally to the caps and made level for their entire length. On this track was a frame on wheels carrying another track at right angles to the first one. From a frame carried by the second track a circular saw was suspended to the shaft arbor with bolts countersunk on the bottom side of the saw. A 20-h. p. engine, with the saw set at the elevation of the pile cut-off, had no difficulty in cutting off the piles 16 ft. below the water surface. Three courses of grillage were pinned together on ways, on the shore, then launched, completed and floated into position, guides were driven, the forms put up and the grillage sunk by putting in the concrete. The greatest variation from true position in sinking was $\frac{1}{2}$ in.

THE HOT CAKE CHANNEL BRIDGE.

At the second crossing of the river the channel is a little less than 750 ft. wide, with a gravel bar 150 ft. wide 200 ft. from the west bank. The bridge consists of a 200-ft. span from the west shore to the bar, 150 ft. of pile trestle across the bar and two 200-ft. spans over the east channel. Test borings at this bridge site showed a very compact uncemented sand and gravel to a depth of 55 ft. As this material was so dense that piles could



Kuskulana Bridge; Copper River & Northwestern.

and at the same time the upper end of the pile was struck short blows with a 4,500-lb. hammer. The average penetration secured in this manner was 36 ft. below cut-off. The excavation for the piers was made largely with 6 and 8-in. sand and gravel pumps, and much of the sand excavated was available for use in concrete.

The range in water level at the bridge location is 8 ft. On account of the fact that there are 4 to 8 ft. of ice formed in the river during the winter, the piers had to be protected by armored ice breakers extending to high water elevation. This protection consisted of old 56-lb. rails placed with the ball out and flush with the face of the concrete. The rails were anchored in the concrete by $\frac{1}{2}$ -in. corrugated bars 48 in. long, passed through holes drilled 24 in. apart in the web of the rails, the bars being bent in until they touched the rail flange, thus providing nearly 2 ft. of anchorage in the concrete. At two of the piers the river was so deep that no excavation was required and the following method of construction was adopted:

When the foundation piles were driven, 8 short piles were driven on each side, 3 ft. clear of the outside pier piles. These short piles were capped longitudinally with the pier, and 70-lb.

not be driven and the gravel was so coarse that a jet could not be used successfully, caissons had to be adopted and as it was not advisable to go to the expense of securing a compressor plant for pneumatic caissons, open caissons, or cribs, were designed and sunk by dredging through hatchways with an orange peel bucket, the entire crib, except the hatchways, being filled with concrete to increase its weight and assist in the sinking. The erection of steel work on this bridge was not particularly difficult and was accomplished without accident.

MILES GLACIER BRIDGE.

The crossing of the river below Miles Glacier was the most difficult on account of the proximity of the two glaciers and the necessity of providing a structure which would not be damaged in the future by the boulders and icebergs which fill the stream at this point. Icebergs were observed passing the site which were 50 x 100 ft. in size, rising 8 ft. out of the water, and moving at the rate of 7.2 miles an hour, notwithstanding the fact that they were dragging on the bottom. The range from low to high water was observed as 24 ft., although no records were available as to former elevations. After carefully observ-

ing conditions, four spans were decided on: No. 1, 400 ft.; No. 2, 300 ft.; No. 3, 450 ft., and No. 4, 400 ft. long. This arrangement of spans places each of the piers on a bar and out of the path of the heaviest flow of ice.

As it was important that the bridge be completed during 1910, span No. 3 was designed to be erected as a cantilever, using spans No. 2 and No. 4 as anchor arms. These two arms were to be connected by temporary members from the top end post pins to the same pins in the 450-ft. span, with adjusting wedges, in connection with wedges between the end shoes at the expansion end and cast iron blocks at the fixed end of the 450-ft. span, to hold the outer end of each half of span No. 3 sufficiently high to be able to make the connection at the center span. The fixed ends of spans No. 2 and No. 4 are next to span No. 3. It was necessary for spans No. 2 and No. 4 each to have rigid lower chords if they were to be used as anchor spans, and span No. 3 to be erected cantilever would require a rigid lower chord except the middle panel, so span No. 1 was designed the same as spans No. 2 and No. 4 for the sake of uniformity. On account of the extremely high winds from September to April, these spans were designed for a wind pressure of 40 lbs. per sq. ft. on the loaded structure, and for 60 lbs. per sq. ft. on the unloaded structure.

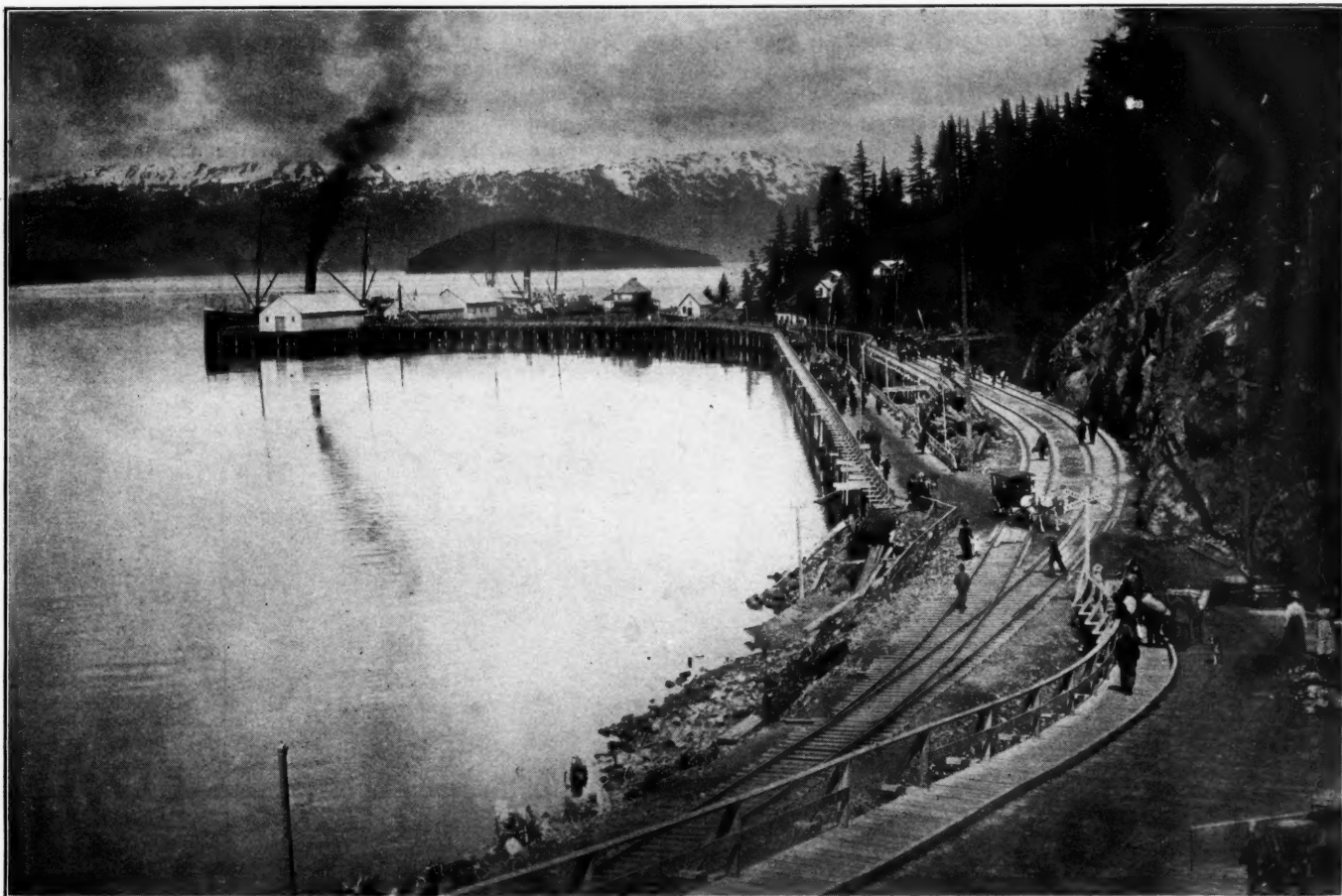
The piers were designed to place the bottom of the lower chords practically 30 ft. above extreme high water, which is ample to clear all icebergs passing under the bridge.

The great flow of icebergs made detached ice breakers necessary at piers No. 1 and No. 2. The ice breakers and all of the piers are armored in the same manner as described above for the Flag Point bridge. Borings at the bridge site showed cemented sand and gravel in the bed of the river with numerous boulders ranging in size from 1 cu. ft. to 20 cu. yds., making it necessary to build the foundations by the use of caissons. Power equipment was installed and pneumatic caissons were used. All equipment for this power plant was ordered as nearly self-contained as possible, and machines were operated on a foundation consisting of 12 in. x 12 in. timbers drift bolted together and resting on the surface of the ground, the only precaution being that no filled ground was allowed under the foundations. The compressors operated almost continuously for nine months without noticeable vibration. The work was begun during the winter and one caisson was completely sunk before the ice went out. Shortly after beginning the work a 1½-in. steel wire cable, supported on towers 100 ft. high on each bank, was stretched across the river to deliver concrete and other supplies to the piers and the opposite bank. The carrier was designed and made on the work after two manufacturers had advised that no carrier is made to operate over the required span, namely, 1,800 ft. The heaviest load carried on this cableway was the man lock, which weighed 5,000 lbs. Two 1-in. steel cables were also supported across the river on a 60-ft. tower on each bank, from which an 8 in. double-riveted steel pipe for supplying compressed air to the caissons was suspended. Air was supplied through this pipe for a distance of 1,300 ft. from the power house with a loss of only 1 lb. from the indicated pressure at the compressor. Concreting was carried on in one of the piers during extremely cold weather by building a house entirely enclosing the pier, with a 6-ft. space outside the concrete forms and over the top of the pier. A 2-in. steam pipe was laid spirally around the pier, the coils being out 6 ft. apart vertically. Two 20 h. p. boilers supplied steam to these pipes and the water for mixing concrete was heated to 110 deg. F. and the sand and rock to about 100 deg. The temperature of the concrete after being carried out over the cableway in buckets, holding ¾ yd., was about 70 deg. F. The sides of the caissons for the ice breakers were made vertical to simplify the framing, and, on account of the excessive friction due to the vertical faces, it was impossible in the case of one of these caissons to force the cutting edge down after having secured a penetration of 19½ ft., although the total load on the caissons amounted to a pressure of 1,410 lbs. per sq.

ft. on the exposed sides and the excavation inside the working chamber had been carried 2½ ft. below the cutting edge. False work for the erection of span No. 1 was driven during the winter, when the ice in the river was 7 ft. thick. One-in. steam jets were used to thaw four holes through the ice at the point where each pile was to be driven. Little or no penetration could be secured, however, in the bottom of the river on account of the size of the boulders encountered. After the completion of this false work and during the erection of a three-bent traveler, the water in the river began rising, lifting the ice and false work on two spans. To prevent the false work from being carried away, a large force of men was kept on the ice equipped with steam jets and chisels welded in the ends of 1-in. pipe to clear the ice away from the piling. In spite of the precautions adopted the false work was lifted several inches in places, although in some instances it settled back to the original elevation when the water subsided. Although span No. 3 was designed for cantilever erection, it was found possible under the conditions existing when the steel for this span arrived to erect it from false work. If it had been erected as a cantilever the opening of the bridge would have been delayed a considerable period, and it was very necessary to open it at the earliest possible date.

KUSKULANA BRIDGE.

The channel of the Kuskulana river at the point of crossing is a gorge 190 ft. wide, 175 ft. deep, with rock walls. The base of rail is 240 ft. above the bottom of the gorge, the grade being level and the bridge on tangent. It was decided to build a deck span 225 ft. long over the gorge to be erected cantilever from two 160-ft. anchor spans to be erected on shore. Steel towers were built for piers to support both ends of the channel span and the outside end of one shore span, the outer end of the other shore span resting on a concrete abutment. The delivery of material to this interior point was very difficult, and on this account the cost in many instances was excessive. The cement for this job was bought in Seattle. The barrels were covered with canvas as protection from moisture; they were shipped to Cordova, and carried up the line 101 miles to Tikel after much delay on account of heavy snows during the winter. It had been expected that the material could be teamed on the ice from this point, but it was so late in reaching Tikel that the ice had gone out of the river, and it was necessary to haul by team on a new wagon road for a distance of 16 miles. This cement delivered at the bridge site cost the company \$20.30 a barrel. As all material was delivered on the south side of the river, a 1½-in. steel cableway was supported on wooden towers on each bank to transport material across to the north side of the river. In excavating for foundations it was necessary to first remove the "tundra" from the surface of the ground, and then wait two or three days for the ground to thaw for a depth of 6 in. to 1 ft. before the next layer could be removed. The climatic conditions at this point were very different from those at the other bridge locations. The temperature is very much lower in winter and higher in summer than along the coast, the range in 1910-'11 being from 67 deg. F. below to 96 deg. above zero. The work of erecting the steel was begun about the first of November, and the work was considerably hindered by the fact that in that latitude the days at this season of the year are only about 4½ hours long, which decreased to about 3 hours in December. On account of the extreme cold weather at this time it was necessary to house all the boilers and engines, and to pipe water and compressed air across the river it was necessary to pack the pipes in a 12-in. box filled with hay and carrying live steam pipes. This box was swung under a suspension foot bridge over the gorge, and in spite of these precautions considerable delay was caused by the pipes freezing. The erection of the steel work was carried on simultaneously from each side by two overhead travelers, one traveler and four hoisting engines having been transferred across the river by the cableway. The two 150-ft. anchor spans and the steel towers were first erected and riveted, and 50 tons of steel



Wharf at Cordova; Copper River & Northwestern.

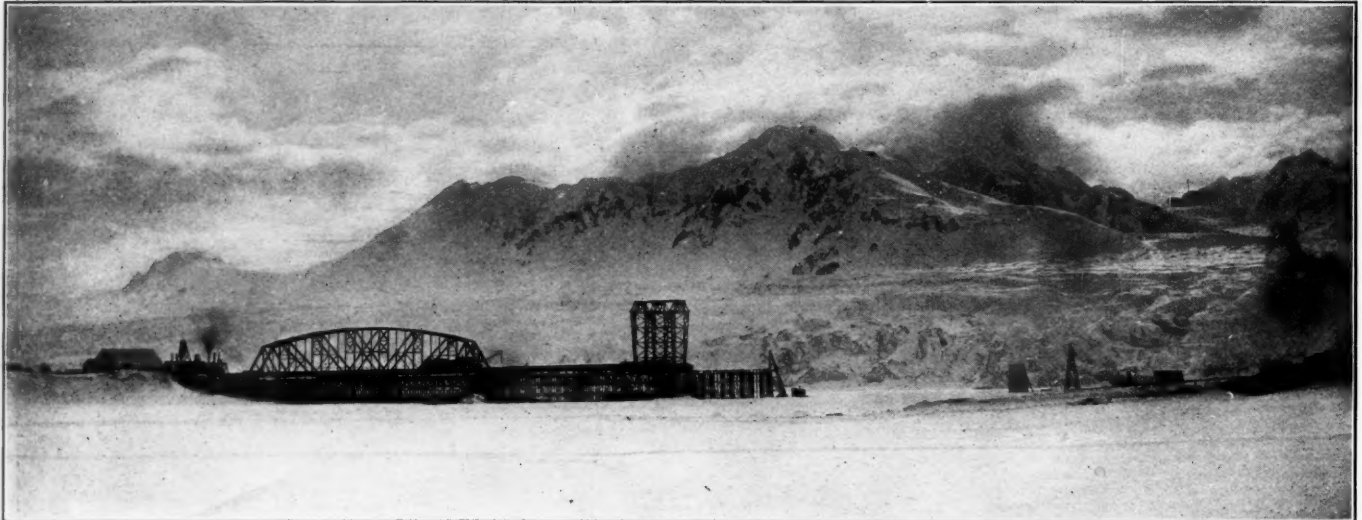


Crossing of Copper River at Mile Post 133.

rails were placed on the outer end of each of these spans to serve as counterweight during the erection of the cantilever span.

The plan followed in erecting this span was as follows: The top chords of the two 150-ft. anchor spans were connected by temporary bars to the top chords of the corresponding halves of the span to be cantilevered. The end shoes of the two spans at the fixed end of the cantilever span were kept in place by built-up compression blocks between them, while at the expansion end of the 225-ft. span cast steel guides were bolted to the end shoes

little higher than normal, and shortened the distance between the lower chord end pins, thus making it easy to drive the pin in the middle of the center panel of the lower chord. After this pin was driven and the middle sections of the upper chords were in position and full bolted at one end, the wedges were slowly drawn while the outer ends of the anchor spans were jacked up, the adjustable bars in the center panel being always under tension. When the unbolted ends of the top chord came into position they were fully bolted, after which the temporary

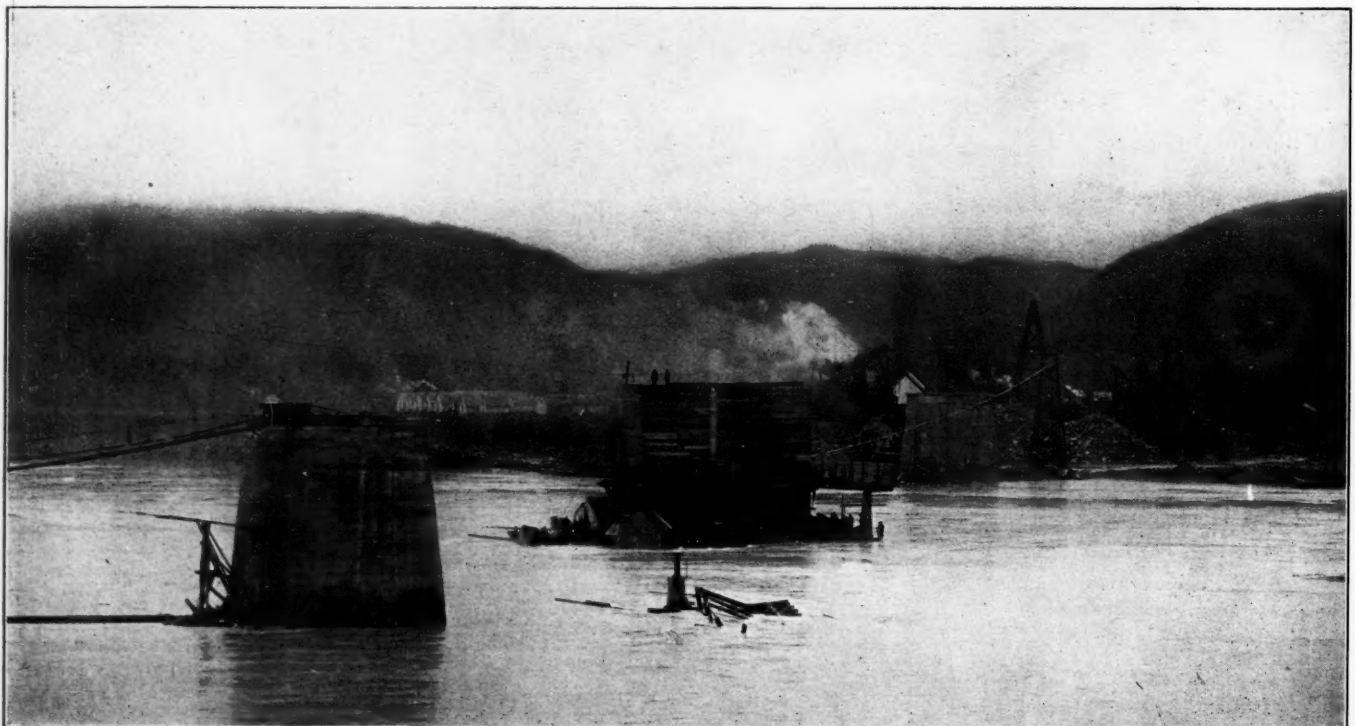


Erection of Miles Glacier Bridge; Copper River & Northwestern.

of the two spans and a cast steel wedge driven between the shoes until the segmental rollers were turned as far toward the center of the span as possible. The wedge had a 6-in. steel shaft 16 ft. long, longitudinally through its center, the shaft being threaded for 6 ft. on one end and held in position by a jam nut at each end of the edge. The wedges were operated by a reversible ratchet nut on the outer end of the shaft and held in position by a yoke attached to the outsides of the end shoes by 6-in. pins. This arrangement held the outer ends of the cantilever spans a

bars connecting the anchor spans and the cantilever span were cut and the shore spans lowered into position.

All equipment was American built and included standard freight and passenger equipment and consolidation locomotives. Practically all other supplies required on the work were manufactured in this country. Bridge timbers were Oregon and Washington fir, while most of the ties and piles were of native hemlock and spruce. The ties secured locally cost 40 cents and piling cost 10 cents a lineal foot. Excellent beds of gravel of



Two Finished Piers and Caisson, Miles Glacier Bridge.

glacial formation were available along the line for filling and ballast. The filling on the line south of the Miles Glacier bridge was practically all secured from three pits, since the material on which track was laid was unsuitable for side borrow. Two large steam shovels were used to excavate this material in the pits and light locomotives to transport it to the desired location. On the upper end of the work considerable filling was handled from side borrow, although the glacial gravel was hauled along the line for ballast. Most of the material used on the interior was delivered by rail, as the track was laid as fast as construction work advanced, but during the summer of 1909, when considerable work was under way near Miles Glacier, two light draft river boats were fitted up for delivering material and men to the camps along the line, and a large ferryboat, with suitable slips for transferring cars of material, was provided in the Miles Glacier lake, an enlargement of the river near that point.

The construction of the main line and the Chitina branch was handled in divisions, each in charge of a division engineer, and each division was sub-divided into residencies under resident engineers. The engineering force was almost entirely composed of experienced railway engineers. The labor was principally Scandinavian and brought in from Canada. A few southern Europeans were employed on the work, but they were soon found to be unable to adapt themselves to the extreme cold. The climate is very healthy, and the work was marked by almost entire absence of illness among the men, while the number of accidents was not above the ordinary for such construction work. An effective hospital service was established at Cordova and Miles Glacier, with emergency hospitals along the line at construction camps.

The work was done under contract by M. J. Heney & Co., under whom a considerable part of the rock excavation was sublet to individuals. The engineering work was under the direction of E. C. Hawkins, vice-president and chief engineer; Alfred Williams, assistant chief engineer; and A. C. O'Neil, bridge engineer.

ANNUAL REPORT OF BLOCK SIGNAL BOARD.

The Interstate Commerce Commission has issued the fourth annual report of the block signal and train control board, M. E. Cooley, Azel Ames, F. G. Ewald and B. B. Adams. One year ago 985 plans of appliances and systems intended to promote safety had been presented and 819 had been disposed of. Since then plans of 96 additional devices have been presented, making a total of 1,081 cases. During the past year 93 cases have been disposed of, and the board now has 169 cases before it for consideration. Statistics of mileage of railways in the United States worked under the block system, have been gathered by the board and published in pamphlet form. Similar information, as of January 1, 1912, is now being gathered.

During the past year three automatic train stops have been approved for test, as follows:

(1) Jones Signal System Company, Atlanta, Ga. Mechanical trip automatic train stop of the ground-contact type. This is an improvement on the device which was mentioned in the last annual report. Permission to install this device has been secured from the New York Central. It is expected that a test will be made during the present winter between Buffalo and Niagara Falls.

(2) The Jones Safety Train Control System Company, Baltimore, Md. Electrically operated automatic train stop of the intermittent contact rail type. An installation has been made on the Western Maryland near Baltimore and it is expected a test will be made during the present winter.

(3) International Signal Company, New York. Automatic train stop of the mechanical trip type controlled electrically. In this system a ramp is fixed on the track in the path of a hanger or plunger carried on the locomotive, the upward movement of which opens a valve in the train line, applying the brakes, unless an arm carried on the locomotive is struck almost simultaneously

by a movable roadside contact member working in connection with fixed signals. Movement of this engine arm closes a valve and prevents the application of the brakes.

The Gray-Thurber system, noted in the last annual report, is a cab signal and automatic train stop requiring short sections of insulated track rails and the insulation of either a truck from the remainder of the locomotive or the locomotive from the tender. It was expected that a test would be made on the Lake Shore & Michigan Southern near Cleveland but the plan has been changed and tests are to be made on the Pennsylvania Company's line near Pittsburgh.

The Robinson Coupler Company, Washington, D. C., has an automatic hose connector, which is being tried on the Phoenix branch of the Marcus division of the Great Northern and a test is planned for. Fifty cars used in the transportation of ore between the mines at Phoenix, B. C., and the smelter at Grand Forks, B. C., are being equipped.

Tests of three automatic train-control devices have been completed during the year, as follows:

(1) The cab signal and automatic train stop of the Electrical Automatic Railroad Safety Signal Company, New York. This was installed on $3\frac{1}{2}$ miles of the Staten Island Rapid Transit Railway. Three locomotives were equipped, and tests were conducted from February 27 to April 4, 1911, inclusive. These tests disclosed constructive faults in certain details of the apparatus, but it was the conclusion of the board that if these faults were remedied the system, with proper inspection and maintenance, would be reasonably reliable and would tend materially to promote safety upon a railroad using it. Details of this test, with a description of the device, will appear in an appendix, not yet issued.

(2) The device of H. G. Warthen, Washington, D. C. The installation was made on about $4\frac{1}{2}$ miles of road on the main line of the Buffalo, Rochester & Pittsburgh near Rochester, N. Y. One locomotive was equipped. The test continued from April 12 to 26, 1911, inclusive. This device is an electrical automatic train stop of the intermittent contact type. As installed, the contact points were located in the center of the track about 22 ft. above the level of the running rails, necessitating the use of an overhead trolley. The results obtained from tests of this device were unsatisfactory.

(3) The mechanical trip automatic train stop of the Railway Automatic Safety Appliance Company, Wilmington, Del. This was installed on the Pere Marquette near Saginaw, Mich., and was tested by the board from March 24 to May 16. In this device the trips employed are located at about the level of the buffer beam on the locomotive pilot. In the Saginaw test two track trips were installed and four engines were equipped. The test disclosed constructive faults in certain details of the apparatus used, and after a careful analysis of the results obtained the attention of the proprietors was called to these constructive faults. The proprietors have redesigned those details of the device that failed to work satisfactorily, with a view of overcoming the faults disclosed by the test, and it is expected that the redesigned apparatus will be subjected to further test during the present winter.

The following miscellaneous devices have been held by the board to possess merit in a greater or less degree, but their use does not affect the safety of railway operation sufficiently to warrant the board in taking special action regarding them.

(1) Ratchet brake lever, R. H. Blackall, Pittsburgh, Pa. (2) Burdette chainless hand brake. (3) Watch and clock dial, H. S. Montgomery, Topeka, Kans. On this dial the minute divisions are numbered. It is the opinion of the board that the use of this dial can certainly do no harm, and where watches equipped with it are used in sufficient light so that the figures can be easily read, the dial may be of considerable advantage in eliminating minor mistakes in reading minutes. When used on a clock of considerable size, it is thought that the benefits would be more pronounced, particularly if the dial were at all times well lighted. The board sees no objection to the use of this dial, but is of the

opinion that there is not sufficient practical reason for recommending its general adoption. (4) Woodall low-water alarm, submitted by John McCaslin, New York. (5) Brake shoe and head, H. H. Urquhart, Paducah, Ky. (6) Ground cone, Paragon Sellers Company, Chicago. The object of this device is to secure a good earth connection for electrical apparatus. (7) Triple-lock switch stand, W. F. Bossert Manufacturing Company, Utica, N. Y.

The board, in its report last year, reiterated its recommendation for legislation to require the use of the block system, and summarized the results obtained from tests of two automatic train-control devices of the mechanical trip type. While these tests indicated that both of the devices tested would require some modification to make them entirely satisfactory, the general results confirmed the view that the principle of the automatic stop is sound; and it is the opinion of the board that the use of automatic train stops would tend materially to increase safety in the operation of trains. . . . The board does not, of course, consider that it has by any means exhausted the field of investigation embraced in the terms of the legislation under which its work has been conducted, but the information gained is sufficient to justify the conclusions now presented.

The broadening of the scope of its investigation in 1908, has required the board to take cognizance of the whole question of safety in railway operation, embracing a great variety of questions which can not adequately be dealt with by an organization such as this board, possessing authority merely to investigate and report.

The Block System.—The board can add nothing to what it has said in previous reports concerning the proved superiority of the block system over the time interval or despatching system of train operation. The increase in mileage block signaled during the past year was practically all upon roads that already had the block system in use. The extension of the system to new roads—that is, to roads which had not before used the space-interval method of train operation—was not such as to warrant the belief that the block system will be brought into use generally within any reasonable period of time without governmental action compelling it. There is ample justification for such action when the number, and particularly the disastrous character, of the collisions which have occurred under the time-interval or train-despatching system is considered, together with the small cost of installation and operation of a simple form of the block system which would very materially diminish the chances of collisions, and it is greatly to be regretted that the extension of the block system has proceeded so slowly. . . . All that the commission has asked is that those roads not using the block system gradually conform to the practice of the roads that do.

Automatic Train Stops.—In its last report the board noted an increased interest on the part of the railways themselves in the development of automatic train-control appliances. As was shown by the annual statistics published by the commission as of January 1, 1911, automatic train stops are in use on the lines of the Washington Water Power Co., the Pennsylvania Railroad in New York City, the Hudson & Manhattan Railroad, and the Erie Railroad, and there is now an installation on the San Francisco, Oakland & San Jose.

The information obtained from tests, together with knowledge of the general state of development of the art of automatic train control leads the board to conclude that there are several types of apparatus and methods of application which, if put into use by the railways, would quickly develop to a degree of efficiency adequate to meet all reasonable demands. Such devices properly installed and maintained would add materially to safety in the operation of trains. In many situations, under conditions existing in this country, the board is convinced that the use of automatic train stops is necessary to the safe operation of trains.

The board does not wish to be understood as stating that the conditions of entirely acceptable automatic train control, as formulated by it in the 10 characteristics published in its report of

last year, are fully met by any one of the devices it has thus far examined. On the contrary, the art of automatic train control is still largely in the experimental stage; but it is far enough advanced to warrant the installation of available devices with a view to their further development to meet the demands of safety in train operation.

Having in mind the protection of train movements in particularly dangerous locations, the board is convinced that were the use of automatic control devices required in such locations railway managers would have no difficulty in complying with such a requirement in a manner fully to meet the demands of safety. . . . Few, if any, of the mechanical or electrical elements entering into the construction of automatic train-control systems involve any new principles, nor are they materially different from the elements used by the railways in the everyday operation of their interlocking and block signals, train brakes, and other devices. The ingenuity and initiative which have been manifested in the development of much of the apparatus used in the conduct of railway business greatly exceeds that required to produce apparatus which can be superimposed upon existing signal systems adequately to compel obedience to the signal indications.

The question of the actual design and construction of the apparatus necessary for automatic train-control systems has not been as great an obstacle in the way of their adoption as the operating questions involved in their use. In view of the manner in which they have been used in the situations where employed, and the skill with which other problems involving the handling of complicated train movements have been met, it is futile to advance any difficulties involved in such a step as an excuse for failure diligently to undertake the development and practical application of such devices to general steam surface railway conditions.

The railways have been decidedly lax in developing the automatic stop, and actual experience is lacking. The board, therefore, does not believe that at the present time legislative compulsion to this end would be wise; it does believe, however, that the railways should be urged and expected to develop the art of automatic train control. Should this not be done with a reasonable degree of expedition, steps should be taken by the government to stimulate action.

It must not be assumed that the use of automatic devices of any kind will remedy all the faults at present existing in train operation. They can not insure that the fundamental conditions of safety will be observed. . . . Bad methods of operation and management, inefficient supervision and inspection, poor discipline, and lack of co-operation between the different branches of the personnel, deficient structures, roadway, and equipment, all of which introduce fundamentally dangerous conditions, still exist, and can not be remedied by the use of automatic appliances.

General Conditions Affecting Safety.—Notwithstanding the increased safety due to the extension of the block system during the last 10 years and to the increasing use of safety appliances, there is no sensible diminution in the total of railway casualties. The fact which has most strongly impressed the board is the lack of some central authority with power adequately to deal with the subject of safety in all its phases. The trouble with all railway safety legislation thus far seems to be that it has only attempted to deal with the problem in piecemeal fashion. Much of this piecemeal legislation has resulted in good, and it has greatly contributed to safety. The safety-appliance acts particularly have been of inestimable benefit to employees. But it is nevertheless true that legislation of this character lacks correlation, multiplies administrative functions, and duplicates work. It very naturally causes irritation and resentment on the part of railway managers, because they know not where it is going to stop and have constantly to create new functionaries and introduce changes in their already complex organizations in order to meet its demands.

The results contemplated by the present law can not be accomplished by any such organization as this board. The mere examination of devices intended to promote safety in railway

operation can lead to but meager results from the standpoint of public safety. This board can do no more than render an opinion concerning the merits of devices examined, and when favorable opinions are rendered it has only the effect to enable the proprietor of the approved device to advertise more extensively. A further evil in the situation is that the proprietors of approved devices, and even many of those that are not approved, are soliciting Congress for legislation compelling the railways to use their particular devices.

Any further legislation dealing with safety in railway operation, to be fully effective, should deal as comprehensively with the whole subject of the physical operation of railways as existing law now deals with the subjects of railway rates and accounts. In other countries it has been found necessary to put such matters in the hands of a commission, a cabinet minister, or some other officer specially qualified. It is the opinion of the board that with respect to the matter of safety the time has come in this country to inaugurate a system of supervision over interstate roads somewhat similar in character to that now administered through the British Board of Trade. An organization should be created having ample, though carefully restricted, powers of investigation and inspection, as well as of administration of laws sufficiently broad to insure adequate regulation of the details of construction, maintenance and operation of all interstate roads, so far as concerns safety.

Such a body should assume control of the functions now comprehended under the various safety-appliance, boiler-inspection, hours of service, and accident investigation laws, and in addition should take cognizance of matters relating to personnel, methods of operation, and the physical construction of railways, as well as the condition of roadway, track and equipment, and should have authority to require repairs or changes to be made when necessary to remedy dangerous conditions. It should supervise train schedules, in so far as safety in train operation might be affected by the physical condition of roadway and the use or non-use of means to promote safety; in short, it should deal as comprehensively with the question of safety on interstate roads as state railway commissions now deal with the question on the roads under their jurisdiction.

The need for such a federal body is shown by numerous instances of unsafe practice which have been observed by the board. For example, a recent collision on one of the largest and best organized roads in this country, a road which has always been foremost in the use of improved apparatus and methods to promote safety, was found to have been due to a deficiency in an interlocking plant. The electric circuits used for controlling the movement of switches and signals at this plant were entirely different from those shown by the circuit plan provided and on file. Inspections conducted by the board have developed numerous facts which lead to the conclusion that in many cases responsible officers either do not know what is going on on their own roads or that they are permitting inexcusably dangerous practices to continue even when the cost of correcting such practices would be insignificant. Periodical inspections by some governmental agency empowered to correct unsafe conditions would have a strong tendency to insure that inspections made by the railways themselves would be more thorough, and that the corrective measures taken by them would be more effective.

Publicity is undoubtedly a powerful influence, but it is too much like a weathercock, which points only when the wind blows, and, if undirected, it can not logically be expected to accomplish more in the future than it has in the past.

The practical effect of the publicity which would be given to bad conditions by the inspections of an organization such as is here proposed would be to compel the observance of proper methods and a stricter observance by railway companies of their own rules and regulations. The conditions necessary for securing safety are well known to railway managers. They are discussed frequently in meetings of railway associations. The existence of these numerous voluntary associations and of the various state

commissions points strongly to the necessity for some clearing house through which the best ideas of all interested parties can pass and be put in such form as to make them available for the benefit of all. The railways are well organized to represent their own interests, as are also their employees, but the public must look to governmental agency to protect its interests. Many of the state railway commissions now exercise within their respective states all the powers here advocated. The board believes that a federal body having similar powers over interstate roads is both reasonable and necessary. The state commissions impose upon the railways a wide variety of regulative restriction, which is not only confusing but annoying. The moral effect of a federal organization in stimulating individuals to greater effort and compelling closer attention to the conditions of safety would be great. In the very nature of things the presence of a properly constituted federal body could not help but tend strongly to unify the practice of different roads, and by co-operation with state commissions evolve a uniformity of governmental requirement highly desirable from the standpoint both of the public and the railways. By harmonious co-operation of the federal government with the companies themselves and with the various state commissions and the associations it is believed that methods could be evolved and standards to suit different conditions gradually adopted in such manner as to prove far from burdensome to the railways and yet greatly promote safety.

Further study could only result in more specific recommendation—such recommendation, in fact, as should form no part of the general legislation proposed. Any further study should be conducted by the railways themselves, acting in co-operation with and under the guidance of such a central authority as is here indicated. Such co-operation is believed to be absolutely necessary if the results obtained are to be homogeneous in character and of any real and lasting benefit. It is idle to expect that any uniformly good results could be expected from the very large number of state commissions acting independently. But if the railways with their organizations and the state commissions can all be brought together and made to co-operate under one central authority, then, and then only, can beneficial results be brought about.

The board has not ignored the fact that the largest railway systems in the world are to be found in this country, and that the magnitude of the problem to be solved is greater than in any other country; the very magnitude of the problem, in fact, is believed to constitute the strongest possible argument in favor of the establishment of a federal body, such as is here advocated, to deal with it. Full weight has also been given to the financial inability of many railways to provide all facilities for promoting safety which their officers would be glad to employ, and full recognition has been made of the progressiveness of the great bulk of railway operating officers. The larger companies, or those whose income is greatest, would probably of their own initiative have undertaken many of the reforms to compel which legislation has been enacted. It is believed that if such an organization as is here proposed were to be created and clothed with adequate power it would be hailed with satisfaction by practically all progressive railway managers.

Such an organization would need to be headed by men of undoubted ability and would require a large force properly to perform its functions. By proper correlation and co-operation of its various agencies, however, the work could be done economically, and it is believed that the total cost of performing these more numerous functions under such a plan would not be greatly in excess of the sum now spent in carrying out the requirements of existing piecemeal legislation.

MINORITY REPORT.

A minority report was submitted by B. B. Adams. He approved the majority report except as to the matter referred to in the minority report. He says that the establishment of a governmental department or bureau to exercise such extensive authority over the railways as is contemplated in the proposal of his

fellow members would be an experiment of such magnitude and would involve such a marked departure from previous practices that it ought not to be tried except in the most cautious and gradual way, after a period of negotiation or tentative action. The evils or weaknesses which are to be found in the railway service, and which are mentioned in the report, are not to be denied or minimized. Many railway corporations are administrative machines of such magnitude that inefficiency in some of their parts is almost inevitable, and in frequent instances the need of correction by an outside authority is undisputed. It is also to be admitted that the piecemeal legislation under which the government at present regulates safety on railways is uneconomical and crude.

In the separate states of the Union and in Europe may be found examples of governmental regulation of the physical operation of railways in which results have been salutary. But to attempt to regulate the operations of 240,000 miles of railway, carried on by 1,500,000 men, in 3,000,000 square miles of territory, through the instrumentality of a man or body of men sitting in Washington, with or without a large number of territorial or district agents, subordinates or associates, would be a task involving many new questions, for the settlement of which there is no precedent to serve as a guide. This government runs the Post Office Department with a good degree of efficiency, but its problems in that department are exceedingly simple compared with the problems of railway operation. The Interstate Commerce Commission inspects freight cars all over the country, and this work has had beneficial results, but here also the problems are simple and are dealt with under the stipulations of a rigid statute. The British Board of Trade has exercised useful functions in the promotion of safety on the railways of the United Kingdom, acting through its four accomplished inspecting officers, but these officers' powers have never been other than recommendatory in any department of their field until after a long period of experiment. Compulsory powers have been granted by Parliament only after the inspectors, the public, and the railway officers have had opportunity to study the situation so as to be able accurately to estimate the probable effect of compulsion.

Conservative public sentiment in this country is jealous of governmental interference in private enterprises. The doctrine of *laissez faire* is not entirely dead and out of date. The country is so large and its problems so difficult that that doctrine is necessary, in spite of its incidental evils. The people are jealous of interference even as to those enterprises which perform public service and exercise monopolistic powers, except as faults of management which harm the public are seen to be so bad that "reform from the inside" can not be hoped for. Bad management, therefore, demands, in the first place, inquiry—publicity. Publicity often cures obscure evils which can not well be reached by governmental agencies directly.

As regards the question of safety, the federal government has thus far attempted no important regulation of railways other than publicity, except to require, as in the safety appliance statutes, that all railways shall adopt the practices of the best railways. In going thus far we are on tolerably safe ground. No very bad mistakes have been made. But for the government to command specific changes in railway practice, except in this cautious way, would introduce a radically different policy. If and whenever an agent of the government decides what a railway officer shall do, the state assumes some degree of responsibility for the acts of such officer.

Beyond publicity we enter an untried field. A railway president has the counsel of a board of directors and the advice of well paid subordinate technical officers. The government investigator, coming in to give these experts advice, labors under serious disadvantage. If he is an expert, like the British officers or like the engineer of an American state railway commission, he will probably have to tackle each problem single-handed. Or, if comparison be made with the doings of some of our state commissions, we see the deadening influence of uncertain tenure of office, im-

perfect appreciation on the part of the public, resulting in small salaries, and the distraction of political influences. The government officer must be a rare man. If the railways, after due warning from the President, voicing an intelligent public sentiment, shall take no effective steps to correct clearly defined evils, this rare man (or men) should be sought out. . . .

The government investigator should be a "high-grade" man, at least as high as the manager of the operating department of any one of our large railways. The tasks being intricate, the officer's education, experience, and character must be so high that his failure to accomplish what is expected or hoped for will not result in his condemnation. A personal character so strong that the public will accept unwelcome decisions is a prime desideratum.

The successful action of the British government in promoting safety on the railways of the United Kingdom has been accomplished by very slow degrees. The four inspecting officers are men of education, technical training and experience. More than that, they follow a pretty settled policy. The appointing power sees to it that vacancies are filled with men who will work efficiently in conjunction with the older inspectors. (The "board of trade," so far as it relates to safety in details of operation, may be said to be simply a minister—the president of the board of trade, who is a political person—and the four inspecting officers; that is all.) Compulsory legislation is adopted by Parliament only where experience has pointed out a plain path. The inspectors are only human and the rule that their conclusions as to railway operation shall be recommendatory and not mandatory is not only desirable but rational.

A very reasonable and safe, yet progressive, course for our government to take in the matter of railway safety legislation would be to enact the proposed law making the use of the block system compulsory. The principal section of this law is drawn in general and liberal terms. It simply requires the block system without prescribing apparatus or details. To require the use of the block system is simply the making of the best practice the general practice. Such a law has a firm basis in experience—widespread, general and long-continued experience. . . . The question of automatic stops, from the standpoint of the United States government, is the opposite of the block-signal problem. Instead of being simple, it is to a considerable degree elusive because many questions concerning the efficient installation and operation of automatic stop apparatus are yet to be settled by experiment. Neither the government nor any other body can at this time prescribe simple rules which are sure to be satisfactory; and a statute dealing with matters of this kind is quite likely to be abortive unless it is simple. It is to be remembered that with the best block signaling facilities and interlocking and with competent enginemen the occurrence of collisions which would have been prevented by the use of automatic stops is so very rare that a mathematical comparison of the relative safety in operation (with versus without stop apparatus) can not be made. Compulsory legislation would be likely to be either wasteful of resources or else ineffective by its crudity. . . .

If three, four, five or six men competent to deal with large questions of railway operation were to take up, on behalf of the government, the problems relating to the safety of passengers and employees which are now pending; if, having full powers of investigation, they were to devote to these problems their entire time for a year or two, and if they were then to lay before the commission, the Congress, and the public the results of their studies, then the proposal of the majority of this board could profitably be considered.

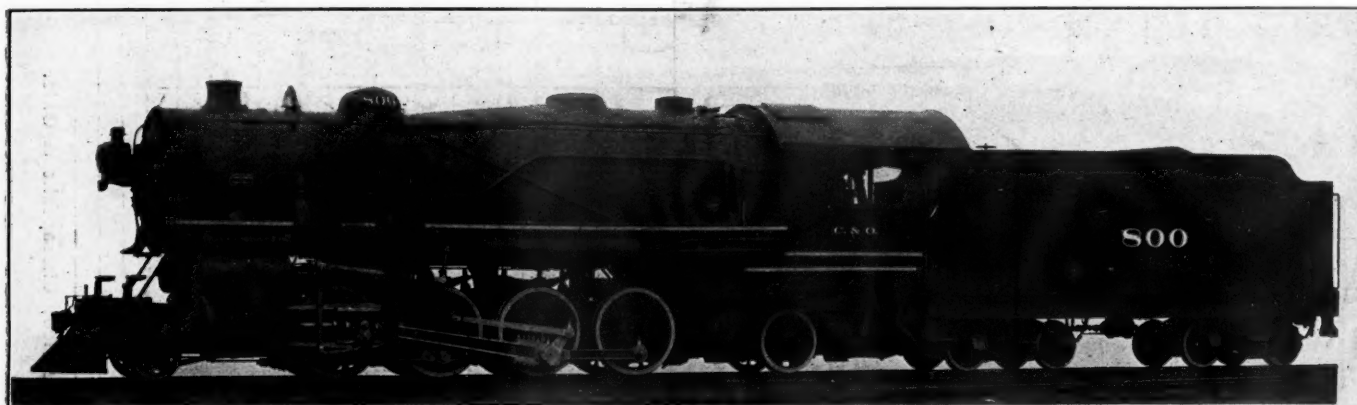
The employees of the Baden State Railways, Germany, who are stationed at places where there is no church of their confession, are granted free passage on trains to the nearest station where there is such a church on Sundays and church holidays. Their wives and their children under 18 are to have the same privilege. Heretofore they were limited to twelve such journeys a year.

MIKADO LOCOMOTIVES FOR HEAVY FREIGHT SERVICE.

Directly in accordance with the continual increase in weights and power of the more common types of locomotives, the heaviest and most powerful Mikado yet built is about to be placed in service on the Chesapeake & Ohio. It was built by the American Locomotive Company, being designed to haul a train of 4,000 tons up a 0.3 per cent. grade at a speed of 15 m. p. h. It has a tractive effort of 60,800 lbs., which is unusually large for an eight-coupled road engine, and is some 3,000 lbs. greater than that of any locomotive of the same type yet constructed. This

is due to the combustion chamber, which in the Mountain type is 42 in. long and in the Mikado, 19½ in. long. The smoke box was also shortened. It must be considered, however, that if there had been no combustion chamber in the Mountain type, a reduction of at least 22½ in. in the length of each of the 238, 2¼ in. tubes would still have been necessary, making a total of 263 sq. ft. less of evaporative heating surface for the Mikado, combined with a proportionate reduction in the superheating surface.

Also, in the ordinary design of locomotives equipped with a fire tube superheater of the type used it is unlikely that it would be possible to move the front tube sheet forward, as was done



Powerful Mikado Locomotive for the Chesapeake & Ohio.

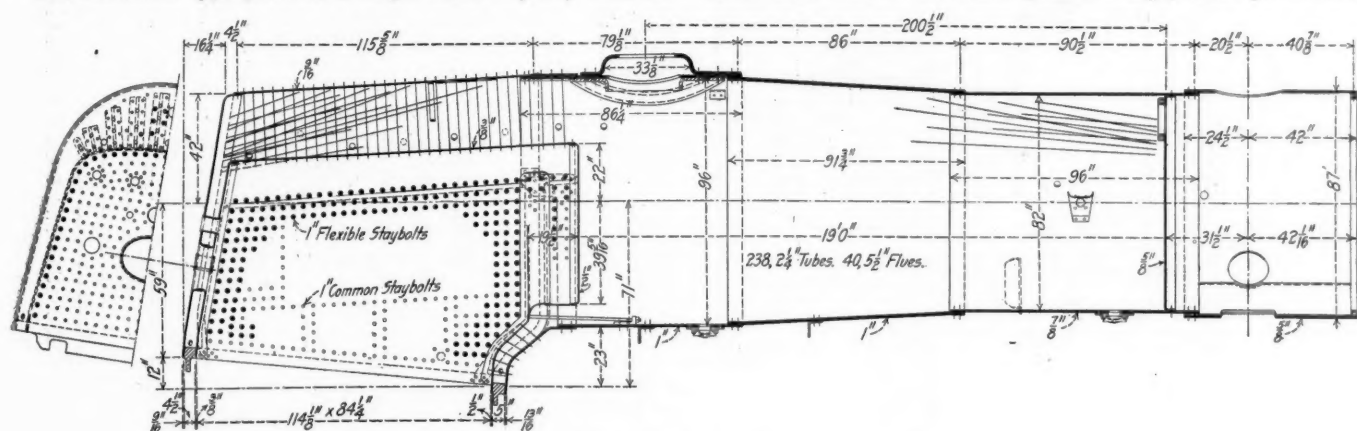
points to widespread possibilities in the Mikado as a design for heavy road service on lines of moderate grades.

Aside from the fact that it is the most powerful locomotive of its type yet constructed, the design presents another still more interesting feature. It was made so that a large number of its parts would be interchangeable with those of the Mountain type locomotives used on the same road and constructed by the same builders. Furthermore, this duplication has been obtained without any sacrifice in the efficiency of the Mikado for its requirements, as a study of the design will show.

The Mountain type provides a larger boiler capacity than the

in this case, the front tube sheet of the Mountain type engine being 52½ in. back of the center of the cylinders. If this could not have been accomplished the tubes would have had to be shortened 35 in., which would result in a still greater reduction in boiler heating surface. In the Mikado locomotive the distance between the center of the cylinders and the front tube sheet is 31½ in.

Both types provide a good firebox construction with a deep throat sheet, although that of the Mikado has been altered to suit the boiler requirements. They both have the Security sectional brick arch of the same general design, although the arch



Boiler of the 158-Ton Mikado Locomotive, Chesapeake & Ohio.

Mikado, and as far as the service possibilities are concerned, this is the real difference between the two. This decrease in boiler capacity is due to the fact that with the 4-wheel truck of the Mountain type locomotive a longer boiler can be used than with the 2-wheel truck of the Mikado. But it will be seen, when comparing this engine with the Mountain type, which was described in the *Railway Age Gazette* of September 22, 1911, that the heating surfaces are not very different, there being a difference of only 180 sq. ft. in the total evaporating surface*. As the length of the tubes is 19 ft. in both cases and the superheating surface is the same, the chief cause of the difference in the boiler capacity

*The total evaporating surface of the Mountain type locomotive for the Chesapeake & Ohio is 4,321 sq. ft. and the same number of tubes is used as in the Mikado.

in the Mikado engine is about 3 in. nearer the crown sheet on account of the difference in the throat sheet necessitating a different curve in the arch tubes.

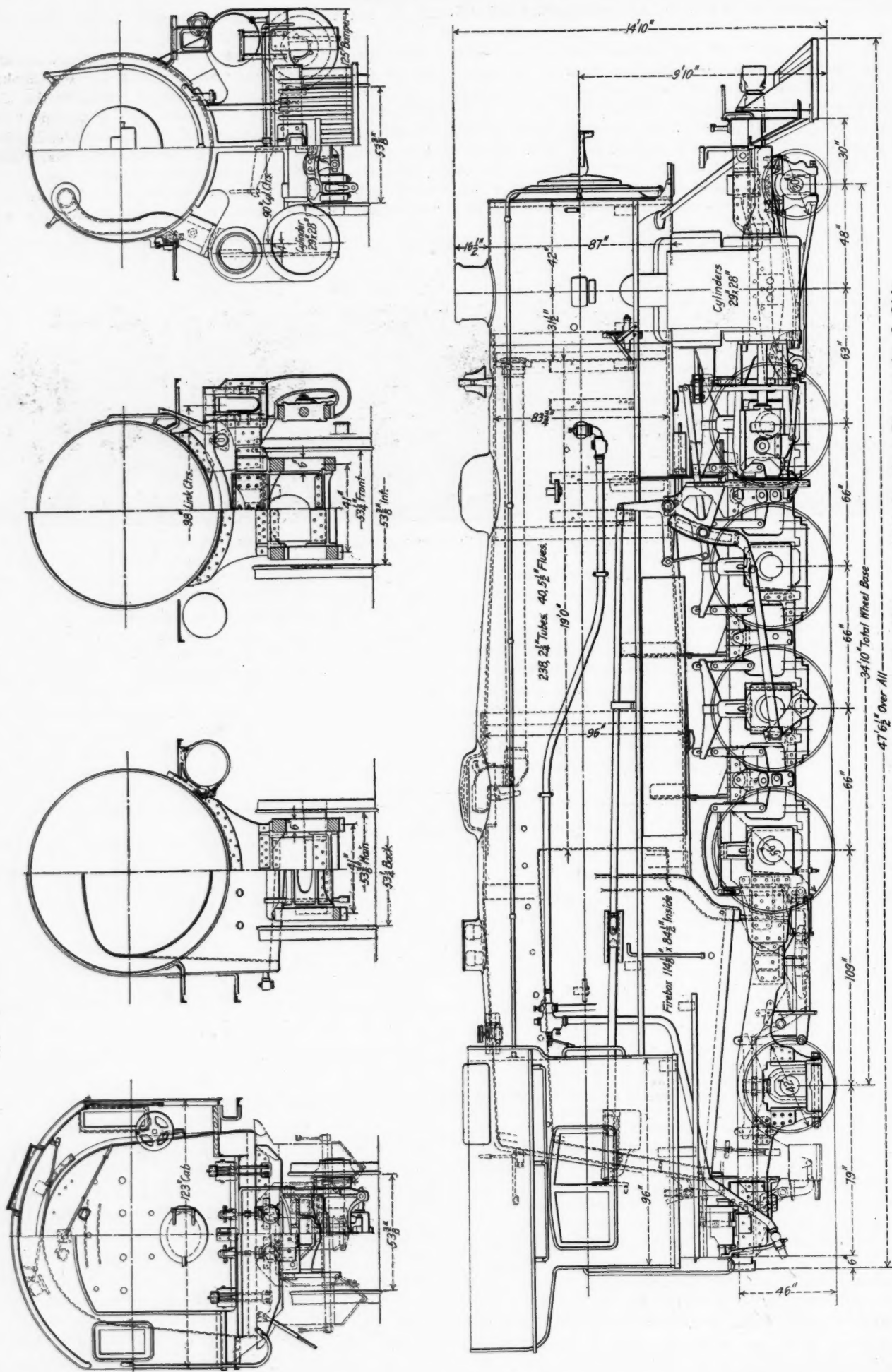
Briefly stated, the other relative advantages of these two types of locomotives as far as service possibilities are concerned are:

Mountain type:

- Greater starting power than the Pacific type.
Greater capacity at speeds proportionate to its smaller drivers than the Pacific type.
Greater boiler capacity, giving greater hauling capacity at higher speeds than the Mikado.

Mikado type:

- Greater capacity at higher speeds than the consolidation.
More weight on drivers for less total weight than the Mountain type.
Greater hauling capacity at moderate speeds than the Mountain type.



Elevation and Sections of Mikado Locomotive for Heavy Freight Service; Chesapeake & Ohio.

From an analysis of the above characteristics it would seem that the Mountain type lends itself readily to a very satisfactory design of locomotive for fast freight service, particularly where a greater capacity at higher speeds is desired than can be provided in the Mikado type. These two types, therefore, where conditions are favorable, as for instance on systems traversing both low grade and mountain grade districts, as in the case of the Chesapeake & Ohio, offer far reaching possibilities for securing a diversity of motive power equipment with interchangeability of detail parts.

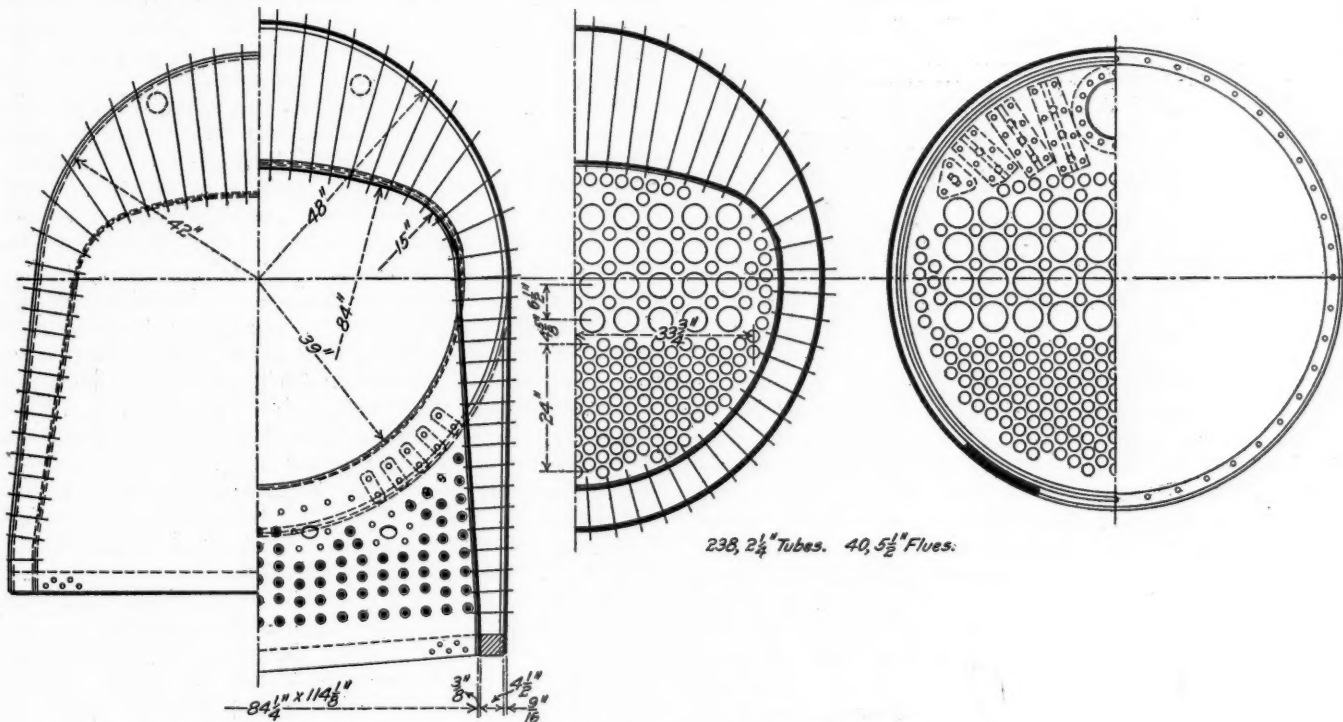
Two of the Mountain type locomotives to which reference has been made have been in very successful operation for the past six months in a most difficult class of passenger service. They are handling trains of 10 and 12 steel cars, weighing 600 to 700 tons on sustained grades of 75 and 80 ft. to the mile with uncompensated curves, making the same schedule speeds (25½ m. p. h.) which the previous 108-ton Pacific type locomotives could barely make with a 350-ton train. The design here illustrated is practically a conversion of the Mountain type into a Mikado by the substitution of a two wheel for the four wheel leading truck of

and 56 in. on the Mikado. The rigid wheel base on both engines is 16 ft. 6 in., but on account of the leading trucks the total wheel base is different. A mechanical stoker of the same type as that with which the previous engines were equipped has also been applied. The various changes in the design have reduced the weight 15,000 lbs., the engine here illustrated having a total weight of 315,000 lbs., as compared with 330,000 lbs. of the Mountain type.

A boiler pressure of 170 lbs. per sq. in. is used on the Mikado type as compared with 180 lbs. on the Mountain type. With the 56-in. drivers and the same size cylinders as the latter type, this gives the Mikado a tractive effort of 60,800 lbs., as compared with 58,000 lbs. for the Mountain type. It is probable that this engine will be used in service similar to that in which the Mallet locomotives of the Chesapeake & Ohio are now operating. This will give opportunity for interesting comparisons, and will attach especial interest to the performance of the Mikado, which should be carefully followed. Following are the important dimensions and ratios of the Mikado locomotives:

General Data.

Type	2-8-2
Service	Freight



Boiler Cross Sections of the Mikado Locomotive.

the former with but few other changes, and those are of such a character that there is duplication between the two classes of almost all the parts that require the most frequent renewals, or need to be kept in stock, as the following list shows:

Trailer truck axles, details of ash-pan rigging, tender truck axles, boiler tubes, boiler flues, dome cap, dome casing, driving boxes, trailing truck boxes, driving box bearings, elvin driving box cellars, trailing truck box, trailing truck box bearings, trailing truck, cab, blow-off cocks, injector steam valves, cylinder cock operating valves, cylinder cock operating cylinders, crank pins (except front pin), cross head, cylinders, cylinder heads, cylinder by-pass valves, cylinder head relief valve, coupler (pilot), coupler pocket casting, coupler pocket pins, eccentric crank, exhaust pipe, fire door, frame pedestal caps, frame shoes and wedges, frame cross ties (between back and main drivers, between main and inter. drivers), foot plate, chafing plate, grates, grate details, grate shaker rigging, pilot, pistons, piston rod, piston rod packing, parts of screw reverse gear, side rods, main rod bearings, sand box, smoke box front and door, link motion (similar), steam chest heads, throttle, dry pipe, valves and packing rings, valve rod and stem, valve rod guide, valve rod packing, driving springs, tender truck springs, tender and details, and tender trucks.

Outside of the differences in the wheel arrangement and a reconstruction of the boiler, which this entails, the other principal change is in the drivers, which are 62 in. on the Mountain type

Fuel	Soft coal
Tractive effort	60,800 lbs.
Weight in working order	315,000 lbs.
Weight on drivers	243,000 lbs.
Weight of engine and tender in working order	484,700 lbs.
Wheel base, driving	16 ft. 6 in.
Wheel base, rear driver to trailing truck	109 in.
Wheel base, total	34 ft. 10 in.
Wheel base, engine and tender	67 ft. 11 in.

Ratios.

Total weight ÷ tractive effort	5.18
Weight on drivers ÷ tractive effort	4.00
Tractive effort × diam. drivers ÷ heating surface	840.
Tractive effort × diam. drivers ÷ *equivalent heating surface	640.
Total heating surface ÷ grate area	60.8
Total *equivalent heating surface ÷ grate area	79.8
Firebox heating surface ÷ total heating surface, per cent.	7.00
Firebox heating surface ÷ total *equivalent heating surface, per cent.	5.31
Weight on drivers ÷ total heating surface	60.
Weight on drivers ÷ total *equivalent heating surface	45.6
Total weight ÷ total heating surface	77.8
Total weight ÷ total *equivalent heating surface	59.2
Volume both cylinders, cu. ft.	21.4
Total heating surface ÷ vol. cylinders	188.
Total *equivalent heating surface ÷ vol. cylinders	248.
Grate area ÷ vol. cylinders	3.12

Cylinders.

Kind	Simple
Diameter	29 in.
Stroke	28 in.

Valves.	
Kind	Piston
Travel	7 in.
Steam lap	1 3/16 in.
Lead	3/16 in.

Wheels.	
Driving, diameter over tire.....	56 in.
Driving, thickness of tire.....	3 in.
Driving journals, main, diam.....	11 1/2 in. x 14 in.
Driving journals, others, diam.....	10 1/2 in. x 14 in.
Engine truck, diameter.....	30 in.
Engine truck, journals.....	6 1/2 in. x 12 in.
Trailing truck, diameter.....	42 in.
Trailing truck journals.....	9 in. x 14 in.

Boiler.	
Style	Conical connection
Working pressure	170 lbs.
Outside diameter of first ring.....	83 3/4 in.
Firebox, width and length.....	84 in. x 114 in.
Firebox plates, thickness.....	3/8 in.
Firebox water space, front.....	5 in.
Firebox water space, sides and back.....	4 1/2 in.
Tubes, number and diameter.....	238—2 1/4 in.
Tubes, number and diameter (superheater).....	40—5 1/2 in.
Tubes, length	19 ft.
Heating surface, tubes.....	3,740 sq. ft.
Heating surface, firebox	283 sq. ft.
Heating surface, arch tubes.....	28.2 sq. ft.
Heating surface, total	4,051.2 sq. ft.
Heating surface, superheating	845 sq. ft.
Heating surface, total equivalent.....	5,318.7 sq. ft.
Grate area	66.7 sq. ft.
Center of boiler above rail.....	9 ft. 10 in.
Top of smokestack above rail.....	14 ft. 10 in.

Tender.	
Tank, style	Water bottom
Frame	13 in. channels
Wheels, diameter	33 in.
Journals	5 1/2 in. x 10 in.
Water capacity	9,000 gals.
Coal capacity	15 tons

*Total equivalent heating surface equals total heating surface (4,051.2 sq. ft.) plus 1 1/2 times superheating surface.

OPPORTUNITIES FOR ECONOMY ON RAILWAYS.

BY L. C. FRITCH, C. E.,*

III.

STATIONERY AND PRINTING.

The item of railway operating expenses classified as "Stationery and Printing" seems to most minds so insignificant as to escape scrutiny, and any effort toward economy in it would seem likely to produce small results. In the aggregate, however, this item forms an important feature of operating expenses. When one reflects that of every dollar expended on our railways a little more than one cent is spent for stationery and printing, it seems worth while to consider if this item is not too large. Not much effort would be required to reduce the expense to three-fourths of a cent, which would mean a saving of about four millions of dollars annually.

During the year 1909 our railways spent about sixteen and one-half millions of dollars for stationery and printing. On one of our largest systems \$2,300,000 was spent for this item alone. During the same year on this same system about one-half million dollars less was spent for steel rails than for stationery and printing. Careful supervision was doubtless exercised in the allotment for steel rails, but was the same care exercised in an item that cost about one-fourth more in the aggregate?

These facts indicate the force of the principle that no item of expense is so small that it does not deserve careful scrutiny and supervision, if the most economical results are to be secured. It is almost safe to say that on some of our large systems of railways a careful and reasonable supervision over this particular item of expense would result in sufficient saving to pay the salaries of all the general officers.

It must be borne in mind that the expense herein discussed includes only the cost of material, and neglects entirely the other large item represented by labor which would include the labor of the clerical force required in the use of the material to "finish the product" and the time consumed by numerous other forces, clerical and official, in contemplating the finished work.

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On one of the representative railway systems investigation shows that over 1,400 forms of stationery are in use. Whether or not this number is actually necessary only a careful analysis will prove. One is reminded of the action taken a number of years ago by a general officer of one of our largest systems, who found on examination that 1,500 forms were in use, and who, by a process of careful elimination reduced this number by less than one-half without detriment to the service. While no arbitrary standard can be practically established to determine the number of forms required to carry on properly the business of a large transportation system the fact remains that without proper supervision and check, it is possible that a multiplicity of forms may creep into the operations that could be eliminated without any effect on the results except a reduction in the cost of stationery and printing and the cost of labor in the use of the forms.

On many railways there is in effect a supervision over this item by a "forms committee," whose duty it is to carefully examine all forms in use and to approve all new forms before adoption and issue. This method has a tendency to reduce the number of forms used to actual necessities, and if the committee faithfully discharges its duties, economical results are certain to accrue. The committee should not only pass judgment on the necessity for the forms adopted, but should regulate the quality and quantity supplied.

If officers responsible for putting forms into effect would stop to consider three things, many needless forms would be eliminated. First, is the form contemplated absolutely necessary? Second, is the expense involved in printing and in using justified by the value of the information given? Third, will the results secured be actually utilized?

The requirements imposed upon railways by commissions of various kinds by rules or laws regulating the operation of carriers are annually costing the railways millions of dollars, much of which is an absolute waste, but a waste which the carriers are absolutely powerless to control. To illustrate, the requirement that a set of tariffs shall be kept on file at each station where shipments are handled is one that costs the roads large sums and is of no possible benefit to the public. Not one person in one thousand could secure the information desired by him by referring to the tariffs. The public is given the right to ask for any rate whether the person requesting the information contemplates shipping or not. At certain large centers full tariff bureaus are required to be maintained at heavy expense. The requirement is entirely unnecessary, as the public is fully protected by the fact that penalties are imposed if carriers quote other than the legal rates filed with the Interstate Commerce Commission.

The interstate commerce law has proved beneficial to railways, but many of its requirements impose needless expense. The cost of stationery and printing in the traffic department of each of our largest railway systems exceeds one-half million dollars a year, a large part of which is due to the publication of tariffs under the requirements of the interstate commerce act. To this expense must be added the cost of compiling the data for tariffs. If reasonable rules were made governing these matters, eliminating all unnecessary and superfluous matter, millions of dollars would be saved annually to the carriers and the public interest would be as fully protected. There are millions of tariffs on file at stations on railways and countless other duplicates on file in the federal and state commissions that are never consulted and serve no purpose. All this waste might be conserved.

From one-third to one-half the cost of stationery and printing is chargeable to the traffic department, which is largely due to the issuing of tariffs. Aside from the opportunity for economizing in eliminating unnecessary tariffs now required by law and orders of commissions great savings can be effected in the method often pursued in issuing tariffs. Original data for compiling tariffs is often incomplete, requiring frequent changes in proofs which must often be made at overtime rates. In many instances the changes made in original copy cost more than the

first setting up of the tariffs. The printing of tariffs is one of the most lucrative jobs for the printer, and one of the most expensive for the railways. A careful inquiry into this matter will cause surprise to some of the roads as to what may be accomplished by the exercise of reasonable care in conducting this important branch of the business. A proper system of tariff filing will also aid in economy in the use of tariffs, reducing both the quantity required and the time necessary to consult them.

There should be a general house-cleaning in the matter of forms in use about once every five years by means of a competent committee appointed for the purpose, such committee having a reasonable representative from each department. It is surprising the number of special forms that are established and continue to be issued and prepared long after their original purpose has been accomplished. A special report may be required for some particular purpose. No instructions are issued to discontinue the report after it is no longer needed, and it continues to be issued and on receipt is promptly consigned to the waste basket, or filed away without comment.

The writer has found it very useful to have compiled once each year a special report by large freight stations of each report made showing "Form No.," "Regular or Special," "Period Rendered," "To Whom Issued" and "Cost of Rendering." The statement is then sent to the heads of the departments with the request to eliminate any reports no longer required. Many unnecessary reports are thus eliminated.

It is important for the proper management of a railway that prompt and accurate knowledge be available showing the results of operation. On many roads the practice is to secure this information from the various departments directly. It is believed that the accounting department should be the clearing house for all data bearing on operation in all its phases. A statistical branch of the accounting department can more promptly and economically collect data on any subject than can be done through various other channels. A traffic officer may desire to know the tonnage and earnings of a given commodity moving between certain points for certain periods. The agents are usually requested to compile such information. The sources of information may be various, and the work may require much time and effort. All the billing records are in the accounting department from which the data could be secured by classification in much less time. The same applies to operating statistics which should be compiled and furnished by the accounting department.

Much can be accomplished by standardizing stationery and supplies by reducing to common standard sizes all forms where possible, issuing half sheets for minor points, reducing the quality of the paper and binding to suit conditions of use and keeping a proper check on distribution and use of supplies. It was found on one road that seventy-two kinds of envelopes were being used. Every possible need could be met with one-half that number.

It has often occurred that in collecting superfluous stationery over a system car loads of stock have been accumulated. First, the distribution of supplies must be regular and systematic. Second, the proper care must be taken of supplies in well adapted cases or rooms. Third, their use must be surrounded with intelligent supervision, and wastefulness must be checked. It should be some one's duty at each location to be responsible for the care, issue and use of supplies. It is the disregard of these seemingly unimportant details that causes most of the waste in this item of expense. Stationery and stationery supplies are commonly regarded as property not worthy of special care and every one uses them indiscriminately and wantonly.

There is no uniformity on various railway systems in the item of cost of stationery and printing, as is evidenced by the following statement which shows the expense of this item for three groups of representative roads. Class "A" embraces six roads of 10,000 miles and upward; class "B" roads of 5,000 to 10,000 miles, and class "C" roads from 1,000 to 5,000 miles. The cost of sta-

tionery and printing for each department, the total cost for the road and the operating expenses in terms of \$1,000 for the year 1909 are given.

CLASS "A."									
Road No.	1,000 Miles.	M. W. Dept.	M. E. Dept.	Traffic Dept.	Trans. Dept.	Genl. Exp.	Total S. & P. Exp.	Total S. & P. Ex. Opr. to Total Op. Exp.	Ratio, Total
1	11	24	40	359	358	90	871	59,375	1.5
2	11	21	25	218	210	97	571	65,364	.9
3	12	69	77	550	596	204	1,496	149,694	1.
4	11	85	191	595	1,147	281	2,299	194,449	1.4
5	10	69	39	161	210	104	583	57,801	1.
6	10	29	39	212	289	125	694	67,460	1.
CLASS "B."									
1	7.8	18	14	132	184	40	388	43,500	.9
2	7.8	11	13	119	161	52	356	39,410	.9
3	6.9	13	7	72	74	35	201	32,579	.6
4	8.2	22	26	254	279	93	674	55,234	1.2
5	6.0	9	7	78	106	52	252	36,504	.8
6	6.2	20	26	161	153	156	516	36,619	1.5
CLASS "C."									
1	4.5	14	20	171	235	74	514	51,887	1.
2	3.6	7	9	63	211	54	344	35,414	1.
3	1.1	11	11	60	107	31	220	19,344	1.2
4	2.5	15	26	105	136	55	337	35,112	1.
5	1.4	4	9	44	61	22	140	20,576	.7
6	2.9	8	9	54	273	46	388	43,340	.9

An analysis of the above statement will quickly determine the roads on which this expense is above the average. The average cost on all roads is about 1 per cent. of the operating expense. Therefore, if two decimal points are placed at the figures of total operating expenses and compared with the figures under total S. & P. expenses, it will be shown whether the expense is low, normal or excessive. The ratio of operating expenses to total expense for stationery and printing shows at once the result on the various roads represented. The poorest showing is made by Roads 1 and 4, class "A," and roads 4 and 6, class "B," and road 3, class "C." The best showing is made by road 3, class "B." There is possibility of improvement on all roads where the ratio exceeds 1.

There is an opportunity for economy in the item of expense of stationery and printing by railways conducting their own printing establishments. This practice is now in effect on a number of large lines. Where the expense runs from \$500,000 to \$2,000,000 per year, an independent railway printing establishment would be justified and prove profitable. Railway printing is not of a highly technical character, and the profits resulting therefrom would accrue to the railway as a saving.

A number of smaller roads could unite in establishing a joint printing establishment on a co-operative basis. Common forms could be used by all lines parties to the plan, changes being required only in the road's title? Any technical work which the road's own plant could not handle could be done by outside concerns.

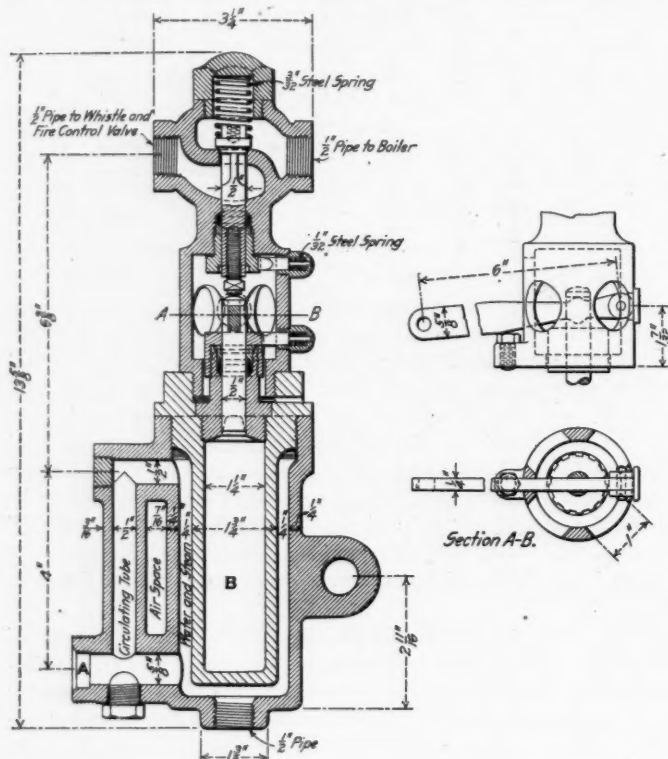
FOREIGN RAILWAY NOTES.

The Russian Warsaw-Vienna Railway, which is to become a state railway, is of the European standard gage, and will probably be changed to the Russian standard (5 ft.). It is almost the only private railway on the Russian border, and in case of mobilization of troops on this frontier a difference of gage would be a serious obstacle, at a point where a very few days' delay might determine whether a campaign would be conducted in Russian or foreign territory.

In the course of his evidence before the New South Wales public works committee in regard to the proposed line from Wyalong to Hillston, via Yalgogrin and Rankin's Springs, W. J. Hanna, under secretary of public works, said that the line would be a little over 110 miles long, and its estimated cost with 60-lb. rails would be \$1,758,775; with 70-lb. rails, \$1,887,960; with 80-lb. rails, \$2,040,075, exclusive of land and compensation. The work on the line will be of like character and the line will pass almost entirely through crown land.

LOW WATER ALARM.

Statistics on boiler explosions, both stationary and locomotive, show that in a large proportion of cases the original cause was low water. This, of course, is generally due to the inattention of the engine crew, but sometimes results from the stopping up of the passages to the water level indicator. For use in either case, an alarm apparatus which automatically blows a whistle when the water level reaches a certain pre-determined point, has been applied to a number of locomotives on the Southern Pacific. It has been in service with excellent results for over a year, and is now being applied to all new power on this road and to some



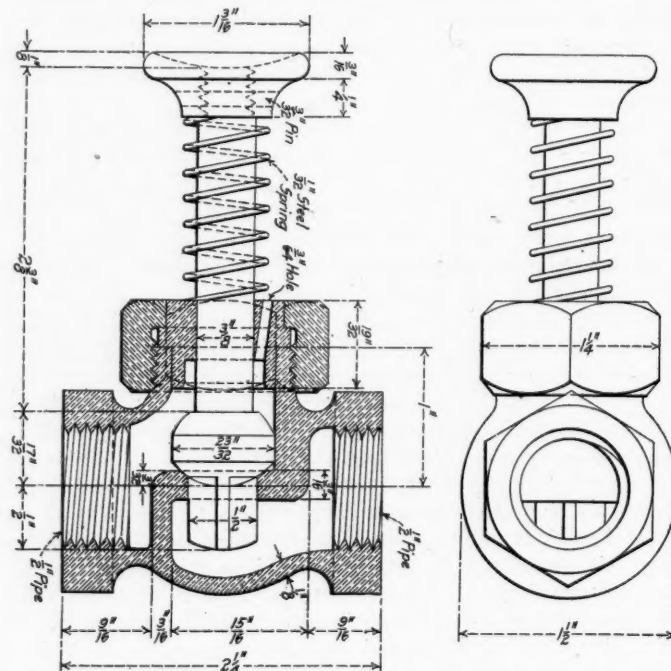
Section of Automatic Low Water Alarm and Fire Control Apparatus.

locomotives on other roads. The apparatus was designed at the Los Angeles shops of the Southern Pacific, and has been found suitable for use on stationary boilers as well as locomotives.

As shown in the illustrations, it consists of a cast iron cylindrical chamber with adjacent passages for the circulation of water and steam, which encloses a steel cylinder B, containing about 3 lbs. of mercury. There is a 3/4 in. space at the sides and bottom between the mercury cylinder and its enclosing casting. A 5/8-in. passage at the bottom leads through A to the connection on the boiler, which is located at a point below which it is believed the

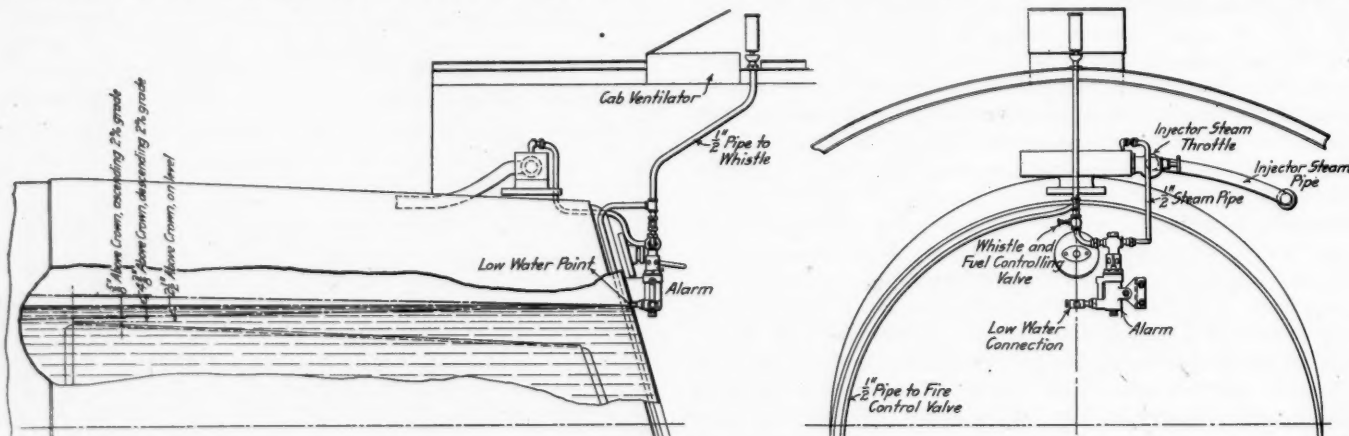
water should not be allowed to drop. The method of determining this point is shown in the general drawing and depends on the grade on which the locomotive is to be operated. It may be seen that the alarm is thus given before the crown sheet is bared, differing in this respect from fusible plugs. Above the mercury is a half-inch piston suitably fitted with packing, which passes through an adjustable connection to the stem on a half-inch steam valve. This valve is held on its seat by a steel spring of sufficient size to force the piston and connecting parts down as the mercury recedes.

The space around the mercury cylinder contains water which is entrapped from the boiler, and since there is no opportunity for circulation, it becomes cool by radiation and is held in place by the pressure in the boiler up to the time the level drops below the opening to the apparatus. When this occurs the water is re-



Semi-Automatic Valve in Pipe Leading to Whistle and Fire Control.

placed by steam, which can circulate through the passages provided for the purpose, and the increase in temperature expands the mercury, forcing up the piston and raising the steam valve, thus allowing the steam to pass to a whistle and to a valve on the oil supply line in case of oil-burning locomotives, or for opening blow-off valve for spraying the fire in case of a coal-burning engine. The whistle will continue to blow and the spray continue over the fire as long as there is any steam in the boiler, unless the semi-automatic valve, which is shown in detail in one of the illustrations is closed. When this is done the flow of steam



Application of Low Water Alarm.

is shut off and the water level can be brought up to the proper point and the operation of the locomotive be continued without loss of time. This semi-automatic valve remains closed until the control valve of the alarm is seated by its spring, which will not occur until the space around the mercury is filled with water and cooled down. When the steam pressure on the semi-automatic valve is then released through the leakage port, the spring raises the valve from its seat and puts the whole apparatus into its original condition ready for service.

GARLAND REFRIGERATOR DOOR FIXTURE.

The difficulties found with nearly all forms of fasteners for refrigerator car doors are well known, and large damage claims are made against railways yearly by shippers, due to the failure in closing these doors tightly and securing them. The Garland door closing and opening device has been designed to overcome these difficulties. Doors equipped with this device have to be closed or opened—there is no half-way position. The appliance consists of two operating levers, each pivoted near the top and bottom of the door and connected by a link at the center of the door. These levers extend beyond the top and bottom of the

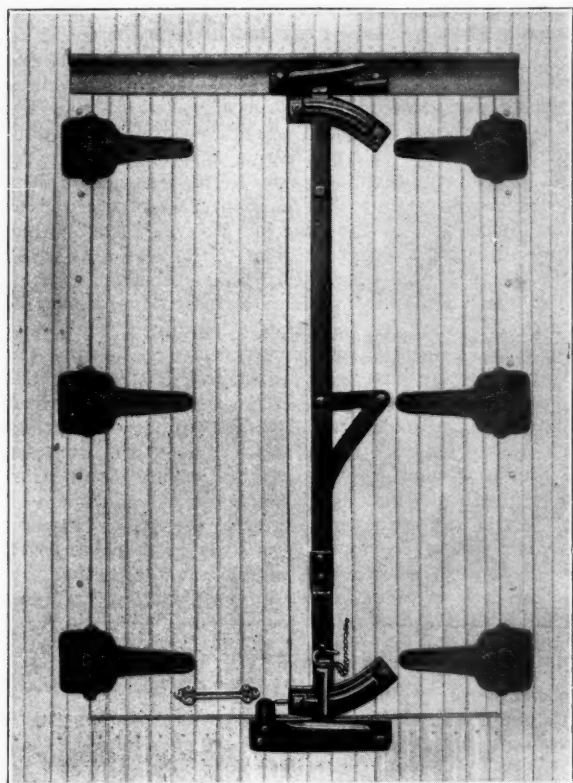


Fig. 1—Refrigerator Door Closed and Ready for Sealing.

door about 3 in. each, forming a wedge. Bolted to the framing over the door, and the sill below it, are keeper castings with beveled lugs for receiving the lever wedges. A locking handle hinged to the upper lever closes over a staple on the lower lever, and is sealed in the usual way. Guides hold the levers in place at the ends.

To close the doors with this device is very simple: First, close the left door; second, place the right door with levers extended to the left, as shown in Fig. 2 (levers will engage keeper castings when door is still between 3 in. and 4 in. open); then pull the hinged lock handle to the right until lever wedges pass into the keeper castings, forcing the doors completely closed. In opening the doors move the handle to the left, causing lever wedges to bear against the inclined face of the keeper castings, forcing the door outward by pressure on the guides. The right door is forced

outward sufficiently by the levers so that it can be easily opened by hand. The keeper castings are extended inward under the threshold plate and across the door rail, where each terminates in a stop lug, preventing the left door being forced inward beyond the proper closed position. Pivoted to the base of the lower

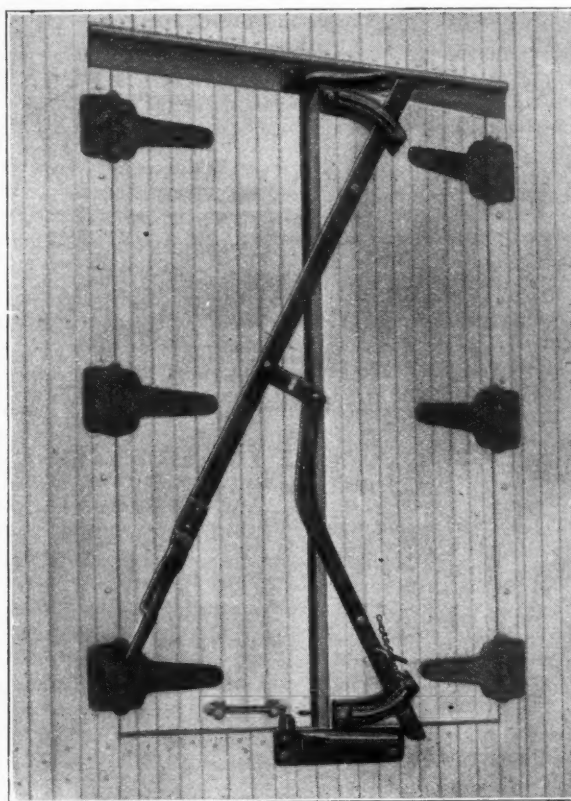


Fig. 2—Levers in Open Position.

keeper casting is a holder to prevent the left door bulging out when the right door is being closed. This device is made and sold by Burton W. Mudge & Company, Chicago.

FOREIGN RAILWAY NOTES.

The railway to Maryvale, Queensland, one of the sections of the long-talked-of Via Recta, was opened September 30. The Premier, who was present, said that the terminus would not remain at Maryvale. Plans for another section between Maryvale and Sandy Creek are to be filed at the next session of the legislative assembly. The great importance of the Via Recta scheme will be that the distance between Brisbane and Warwick will be reduced from 180 miles to 90 miles.

A contract was signed on November 9 between the Uruguayan government and the Midland Uruguay Railway for the construction of a branch line from Tres Arboles to Piedra Sola. This spur of 33 miles will connect the Midland lines and the northern half of the Central Uruguay's northern extension to Tacuarembó and Rivera, and will make a more direct route to Faysandu and Fray Benitos, the latter of which is fast becoming an embarking port of importance for livestock and produce.

To a recent deputation, the commissioner for railways of Queensland announced that he intended to use buffet cars on the railways with the object of supplying tea, coffee, soft drinks and fruit to passengers in transit, a supply of tropical fruits being a feature of the scheme. Approval has been given for the construction of a car at the Ipswich railway shops as an experiment. It has not been decided on what line the car will be tried, but it is probable that at first the car will be run on the western trains.

General News Section.

The government has begun suit in New Hampshire against the Boston & Maine to recover penalties for seven violations of the hours-of-service law, which it is alleged took place last July.

The government has begun suit in the federal court at Hartford, Conn., against the New York, New Haven & Hartford, to recover \$11,500 in penalties for violations of the hours-of-service law, in overworking enginemen and trainmen in twenty-three cases.

Suits have been filed in the United States district court at Denver, Colo., charging 22 violations of the federal hours of service law by the Colorado & Southern, and five by the Colorado Midland.

The Canadian Pacific has decided to operate its locomotives on the Mountain division between Field, B. C., and Kamloops, with crude oil as fuel. Seventy-six locomotives are to be converted into oil burners, and seven oil tanks of 200,000 gal. capacity each will be erected at various points on this portion of the line.

At Pau, France, January 24, Maurice Tabuteau, flying in a monoplane, covered a distance of 196 $\frac{3}{4}$ miles in three hours; an average of over 65 miles an hour. At Johannisthal, Germany, on January 25, Dr. Ulrich, flying in a monoplane, with three companions, remained on the wing at the aerodrome one hour thirty-five minutes.

The Texas railway commission has rejected the application of the International & Great Northern for authority to issue \$3,000,000 of bonds to cover the cost of laying heavier rails on the lines between San Antonio and Laredo and Valley Junction and Spring. The commission announced that it would adhere to the rule of the Interstate Commerce Commission that only the difference in the cost of new and of old rails can be charged to capital account.

The Erie Railroad has announced the names of the track supervisors and foremen to whom have been awarded prizes for excellence in track work during the past year. The aggregate amount of these prizes was \$2,925, the prizes being, usually on the larger divisions, \$100 first and \$50 second. On the Erie Railroad grand division, the first prize, \$100, went to D. C. Lyons and the second, \$50, to J. Kennedy; these in addition to division first prizes awarded to each of these men.

The Federal Civil Service Commission announces examinations to be held February 20 to secure candidates for the position of passenger-rate clerk in the Quartermaster's Department at Chicago; salary, \$1,200. There may be vacancies in other branches of the service requiring similar qualifications. A passenger-rate clerk has to revise transportation accounts and see to their payment, and must be thoroughly conversant with the intricacies of the various passenger-rate compendiums and tariffs, and the written and unwritten rules and customs of the carriers.

The Jacobs-Shupert U. S. Firebox Company is to conduct comprehensive tests of the Jacobs-Shupert firebox in comparison with a similar firebox of the standard staybolt type at Coatesville, Pa. Dr. W. F. M. Goss, Dean of the College of Engineering, University of Illinois, is to act as expert, outlining and afterwards directing the tests. The first series of tests will be made February 1, to determine the relative amount of heat absorbed by the fireboxes of the two boilers under similar conditions of operation. A second series, which will concern the low water tests, will begin on or about April 1.

According to investigations made by the New York State Public Service Commission, Second district, a telephone operator ought to answer calls on an average within 3 $\frac{1}{2}$ seconds from the time the call is made, and clear the connection, after the conversation, within 3 $\frac{1}{2}$ seconds. This being done, the operator should be ready to respond to a call for another number within four seconds. Statements of the average results found in a number of cities are given in the commission's report. No single city shows the highest average in any one of these three elements, but at Elmira, N. Y., the average answer was made in 3.4 seconds and the average disconnection at the end of 3.1 seconds.

Committees of the Brotherhood of Locomotive Engineers have presented to all of the prominent railways east of Chicago and north of the Ohio river and the Norfolk & Western Railway, a request or demand for increased pay, the percentage called for being from 15 to 25 per cent. The object of the enginemen is to standardize the scale on all lines in this territory, as was done in the cases of the conductors and brakemen in 1910. The General Managers' Association has been asked to appoint a committee to negotiate with a committee of the Brotherhood in order to deal with the question collectively. A definite relation between the wages paid to enginemen and to trainmen and conductors has heretofore always existed, and the enginemen believe that they are entitled to a fixed advantage in wages over these other arms of the service. The increase granted to trainmen and conductors in 1910 destroyed this settled relation. A president in discussing this phase of the demands asserted that there was only one solution, for a difficult question of this kind at the present time, namely, reduce the wages of conductors and trainmen in the same ratio that those of the enginemen are advanced.

The proposed contract between the Illinois Central and the Board of South Park Commissioners of Chicago, which provides that the railway shall surrender to the board its riparian rights on the shore of Lake Michigan in return for a grant of additional land to permit of the widening and straightening of its right of way in Chicago, together with the right to fill in additional submerged land, has been subjected to considerable objection during the hearings before the city council committee. Members of the City Club have charged that the plan would give the road far greater benefits than would be received by the city. The contract proposed by the board has been defended as of enormous advantage to the city by Mayor Harrison, by the park commissioners and by members of the city plan commission, who are interested in securing the improvement of the lake front, for which the plan provides, including the erection of a new passenger station for the Illinois Central. The members of the City Club presented figures estimating the value of the property to be granted to the road at \$21,290,000, and that to be turned over to the city at \$3,930,000. It was shown by the advocates of the plan, however, that these figures were obtained by placing a high value on the land to be made by the Illinois Central by filling, without including a corresponding value for the land to be filled in by the city. President C. H. Markham of the Illinois Central has addressed a letter to the Mayor, stating that the company will not accept the ordinance as it has been revised in committee, providing, as it does, for restricting the use both of the land included in the present right of way, and of that included in the proposed grant of additional territory.

Safety Work on the Frisco.

W. B. Spaulding, chairman of the central safety committee of the St. Louis & San Francisco, has compiled a report of the casualties on the Frisco Lines for the last six months of 1911, during which the safety committee plan has been in effect, together with a comparison with the corresponding period of 1910. The report shows a great improvement in the safety of both the passengers and employees, which is attributed largely to the work of the safety committee.

There was a decrease of 5, or 14 per cent., in the number of persons killed, from 108 in 1910 to 93 in 1911. The number of injured was reduced from 2,950 in 1910, to 2,714 in 1911, a reduction of 236, or 8 per cent. In other respects the improvement is shown in the following table:

Year.	No. casualties.	Cash settlements.	Average per case settled.
1910	3,058	1,106	\$135
1911	2,807	909	89
Decrease	251 or 8%	197	\$46 or 34%

The January number of the company's employees' magazine, *The Frisco Man*, was made a "safety first" issue, and contained articles from both officers and employees of the company, including B. F. Yoakum, chairman of the board; President B. L. Winchell and Vice-President W. C. Nixon, urging the importance of

promoting safety in operation. Several illustrations were presented of common ways in which employees are killed or injured, largely through their own carelessness; together with statistics showing the number of casualties to employees during the past year caused in these ways.

Coroner's Verdict Illinois Central Disaster.

The coroner's jury selected to inquire into the accident on the Illinois Central at Kinmundy, Ill., on January 22, has returned a verdict placing the blame for the accident upon Henry Schniederjohn, operator at Edgewood, and Harry J. Broecker, flagman on train No. 25, the express train which was struck by the Panama Limited. The jury also decided that the railway erred in not maintaining a sufficient interval between the trains. The operator is blamed by the jury for the same reason.

According to the report of the board of inquiry, appointed by the railway to investigate the causes of the wreck, whose findings were published in the *Railway Age Gazette* last week, the operator was not at fault. The rules of the railway require a ten-minute interval on that portion of the line, and the board found that the trains were correctly spaced both at Effingham, 30 miles north of Kinmundy, and at Edgewood, 14 miles north. No. 25 left Effingham at 11:49 p. m., passed Edgewood at 12:10 a. m., and was struck by No. 3 between 12:30 and 12:34 a. m. No. 3 left Effingham at 11:59 p. m. and passed Edgewood at 12:20 a. m. As to the flagman, the verdict of the jury coincides with the report of the board, which found the flagman negligent in failing to protect his train.

United States Steel Corporation's Earnings.

The report of the United States Steel Corporation for the quarter ended December 31, 1911, shows that the total net earnings were \$23,105,115, after deducting all expenses incident to operation, including those for ordinary repairs and maintenance of plants, and interest on bonds and fixed charges of subsidiary companies. This compares with \$25,990,978 earned in the corresponding quarter of 1910, and \$40,971,309 in 1909. The earnings for the last quarter of 1911 were better than expected, as it had been estimated they would not exceed \$22,000,000. The surplus for the year was \$89,638 in 1911, as compared with a deficit of \$5,591,968 in 1910. An appropriation of \$6,000,000 for additions in 1910 largely accounts for this difference, as no appropriation for additions was made in 1911. The net earnings for the calendar year in 1911 were \$104,255,563, compared with \$141,054,755 in 1910 and \$131,491,414 in 1909. The net earnings for the last quarter of 1911 were lower than for any similar quarter since 1904, when they were \$21,466,631. The net earnings for the months of the last quarter of 1911 were \$9,159,338 in October, \$6,946,717 in November and \$6,999,060 in December.

Hard and Soft Rails.

The public demands, and rightly, that railway transportation shall be safe and that rails shall not break. I am absolutely convinced that if the railways are to accomplish this they must be prepared to face a greater wear on steel rails. In other words, under the severe and often unknown demands of modern railway traffic choice must be made between safety and wearing quality in steel rails. Beginning about 1890, the railways of the United States began asking for higher carbon in steel rails, to secure great wear; and the railmakers, unwisely, and many times under protest, made the quality of steel demanded. Gradually the specifications called for still higher carbon, until today I believe the steel is within the danger zone of brittleness.

It is true, many of these hard rails never break, but the liability of breakage is much greater than in the old-time softer steel, and the influence of the unavoidable contingencies of manufacture, such as seams, pipes, and segregation, is much greater. In many respects the steel is more doubtful, more dangerous, and more treacherous. It is unquestionably, in my judgment, an unsafe grade of steel, in view of the severe conditions of service. If safety is to be the first consideration, lower carbon and softer steel would seem to be necessary. With such steel the various unavoidable defects or variations of commercial rails would be far less dangerous.

I believe I am correct in saying that harder steel is used in rails in the United States than in any other country, yet our

wheel loads and train loads are much greater than those on foreign roads. When with increased weight of motive power and rolling stock it became necessary to strengthen our bridges, our engineers did not try to do so by using a harder and higher tensile strength steel. They increased the amount of metal of the kind they had been using, because they knew they must have a safe steel and large factor of safety. You might say that a soft rail would wear out more quickly. The old soft rails under the conditions of their day gave very satisfactory wear. It is my belief that that wear would be less rapid than most people estimate, provided of course, the section of rail is heavier.—*President Farrell, United States Steel Corporation, before the Congressional Committee.*

The Steel Corporation and Its Railways.

Herbert Knox Smith, Commissioner of Corporations, has made a report on the cost of steel, in which he says that the United States Steel Corporation makes excessive profits. The report was presented to President Taft and sent to the House Committee on Ways and Means for consideration in connection with revision of the steel schedule.

"The prices of lake ore," the report says, "have been kept for many years at an unreasonably high level compared with the cost of production."

In connection with the alleged excessive profits realized by the corporation from its ore railways, Commissioner Smith raises the question whether the public interest does not require a segregation of the ore railways from the Steel Corporation.

The report is based on an investigation of two-thirds of the country's production of iron and steel from 1902 to 1906, inclusive. It is estimated that the corporation has fully 1,200,000,000 tons of ore in the lake region. It is held that the price of Lake Superior ore during the greater part of the period 1902 to 1906, and, indeed, back to 1895, has been established in large measure by agreement among the principal ore-producing interests.

The transportation of 60 cents a ton realized by the Steel Corporation on its own ore over its principal ore-carrying railways and in lake vessels was "grossly excessive," the report alleges. As evidence of this, it is added that the corporation recently reduced the rates on its two principal ore roads.

It is safe to assume that the present reduced rate of 60 cents a ton is still excessive.

The report adds:

"Integration of industry to permit of large scale operations at minimum costs is exceedingly desirable, but integration of the steel industry with respect to transportation thus far instead of working to the advantage of the public in the form of lower costs to all shippers and lower prices has inured to the benefit of a great combination. Segregation of these railway properties from the Steel Corporation would stop what is unquestionably an evil, the imposition of high rates upon competitors' shipments. While in the case of integration of ordinary manufacturing enterprises it may be entirely proper that the most aggressive concern should reap the benefit of its enterprise, it is unquestionably different in the case of a public utility, such as a railway. Competition in the construction of railways is often impracticable. Moreover, the important ore roads of the Steel Corporation were obtained, not through superior ability, efficiency or foresight, but simply through superior command of capital as a result of combination."

Citing steel rails as an illustration, the report shows the cost of manufacture from the raw material to the finished article, in a comparison between the "book cost" of the corporation, which includes the inter-company profits, and the actual cost. The "book cost" on heavy Bessemer rails was \$21.27. The intermediate profits were \$2.47, making the revised cost \$18.80. The price of Bessemer steel rails, the report says, has been fixed for more than ten years at about \$23 a ton. It is roughly estimated, according to this, that the profit on rails thus equals from 11 to 17 per cent. of the investment.

"The most significant profits," the Commissioner continued, "were those on ore and on railway transportation."

Commissioner Smith calls attention to the very low costs for Southern pig iron. The chief reasons for the higher furnace cost of Northern pig iron were the large freight charges involved in assembling the raw materials at the Northern furnaces.

A Bill for Publicity About Sales of Securities.

Representative Harrison, of New York, has introduced in the lower house of Congress a bill which in general embodies the recommendations made by the Hadley securities commission in regard to publicity of the facts relating to the issue of securities by railways and other public service corporations. The bill would require corporations to file with the Interstate Commerce Commission, on or before the date of the issue of securities running more than a year, certain information, and require the filing of the same information for securities running less than a year, but would allow ten days within which to file the information. The principal requirements are that the total amount of the issue of securities authorized and the total amount sold, with a detailed description of the securities, should be filed; that the terms of sale shall be stated, and if part of the consideration is not paid in money, a detailed description of such consideration shall be given; and it is provided that if the par value is not shown on the certificate, the number of shares then and previously outstanding must be shown. It is made the duty of the commission to enforce these provisions and to make public the information received at its discretion, the certificates of notification, however, being at all times deemed public records and open to inspection. The corporations may be required by order of the commission to disclose every interest of the directors in any transaction. It is provided that the penalty for violation of the requirements shall be a fine of not more than \$5,000 for each offense; and in addition, any director, officer, receiver, or trustee filing erroneous statements is made guilty of a misdemeanor, and may be fined or imprisoned for not more than two years.

New South Wales Railway.

A vigorous railway extension policy is being pursued by the government of New South Wales, and the following proposals have been referred for the consideration of the public works committee: Railways from Coonabarabran to Burren Junction, 87½ miles; Ballina to Booyong, 12 miles; Henty to Daysdale, 46 miles; Canowindra to Eugowra, 20 miles.

MEETINGS AND CONVENTIONS.

The following list gives names of secretaries, dates of next or regular meetings, and places of meeting.

AIR BRAKE ASSOCIATION.—F. M. Nellis, 53 State St., Boston, Mass.; annual, May 7-10, Richmond, Va.
 AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—A. G. Thomason, Boston, Mass.; annual, May 10-11, San Francisco, Cal.
 AMERICAN ASSOCIATION OF GENERAL PASSENGER AND TICKET AGENTS.—W. C. Hope, New York; next convention, Seattle, Wash.
 AMERICAN ASSOCIATION OF FREIGHT AGENTS.—R. O. Wells, East St. Louis, Ill.; annual, June 18-21, Chicago.
 AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—O. G. Fetter, Carew building, Cincinnati, Ohio; 3d Friday of March and September; annual, March 17, Chicago.
 AMERICAN ELECTRIC RAILWAY ASSOCIATION.—H. C. Donecker, 29 W. 39th St., New York.
 AMERICAN ELECTRIC RAILWAY MANUFACTURERS' ASSOC.—George Keegan, 165 Broadway, New York. Meetings with Am. Elec. Ry. Assoc.
 AMERICAN RAILWAY ASSOCIATION.—W. F. Allen, 75 Church St., New York.
 AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W., Chicago. Convention, 3d week in Oct., Baltimore, Md.
 AMERICAN RAILWAY ENGINEERING ASSOCIATION.—E. H. Fritch, Monadnock Block, Chicago; annual convention, March 19-21, 1912, Chicago.
 AMERICAN RAILWAY MASTER MECHANICS' ASSOC.—J. W. Taylor, Old Colony building, Chicago. Convention, June 17-19, Atlantic City, N. J.
 AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—M. H. Bray, N. Y., N. H. & H., New Haven, Conn.
 AMERICAN SOCIETY FOR TESTING MATERIALS.—Prof. E. Marburg, University of Pennsylvania, Philadelphia, Pa.
 AMERICAN SOCIETY OF CIVIL ENGINEERS.—C. W. Hunt, 220 W. 57th St., New York; 1st and 3d Wed., except June and August, New York.
 AMERICAN SOCIETY OF ENGINEERING CONTRACTORS.—J. R. Wemlinger, 13 Park Row, New York; 2d Tuesday of each month, New York.
 AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York.
 AMERICAN WOOD PRESERVERS' ASSOCIATION.—F. J. Angier, B. & O., Baltimore, Md. Convention, 3d week in January, 1913, Chicago.
 ASSOCIATION OF AMERICAN RAILWAY ACCOUNTING OFFICERS.—C. G. Phillips, 143 Dearborn St., Chicago; annual, June 26, 1912, Quebec, Que.
 ASSOCIATION OF RAILWAY CLAIM AGENTS.—J. R. McSherry, C. & E. I., Chicago; annual convention, May 22, 1912, Los Angeles, Cal.
 ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andreucetti, C. & N. W. Ry., Chicago.
 ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—P. W. Drew, 135 Adams St., Chicago; annual, June 24, 1912, New York.

ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—G. P. Conrad, 75 Church St., New York.
 CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk Ry., Montreal, Que.; 2d Tuesday in month, except June, July and Aug., Montreal.
 CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 413 Dorchester St., Montreal, Que.; Thursdays, Montreal.
 CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 North 50th Court, Chicago; 2d Monday in month, Chicago.
 CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York; 2d Thurs. in Jan. and 2d Fri. in March, May, Sept., Nov., Buffalo, N. Y.
 CIVIL ENGINEERS' SOCIETY OF ST. PAUL.—L. S. Pomeroy, Old State Capitol building, St. Paul, Minn.; 2d Monday, except June, July, August and September, St. Paul.
 ENGINEERS' SOCIETY OF PENNSYLVANIA.—E. R. Dasher, Box 704, Harrisburg, Pa.; 1st Monday after 2d Saturday, Harrisburg, Pa.
 ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—E. K. Hiles, 803 Fulton building, Pittsburgh; 1st and 3d Tuesday, Pittsburgh, Pa.
 FREIGHT CLAIM ASSOCIATION.—Warren P. Taylor, Richmond, Va.; annual, May 15, Buffalo, N. Y.
 GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—E. S. Koller, 226 W. Adams St., Chicago; Wed. preceding 3d Thurs., Chicago.
 INTERNATIONAL RAILWAY CONGRESS.—Executive Committee, rue de Louvain, 11 Brussels; 1915, Berlin.
 INTERNATIONAL RAILWAY FUEL ASSOCIATION.—D. B. Sebastian, La Salle St. Station, Chicago. Convention, May 22-25, Chicago.
 INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—L. H. Bryan, Brown Marx building, Birmingham, Ala. Convention, July 23-26, Chicago.
 INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.—A. L. Woodworth, Lima, Ohio. Convention, August 15, Chicago.
 MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 95 Liberty St., New York; annual convention, May 14-17, Pittsburgh, Pa.
 MASTER CAR BUILDERS' ASSOCIATION.—J. W. Taylor, Old Colony building, Chicago. Annual convention, June 12-14, Atlantic City, N. J.
 MASTER CAR AND LOCOMOTIVE PAINTERS' ASSOC. OF U. S. AND CANADA.—A. P. Dane, B. & M., Reading, Mass. Convention, 2d week in September.
 NATIONAL RAILWAY APPLIANCE ASSOC.—Bruce V. Crandall, 537 So. Dearborn St., Chicago. Meetings with Am. Ry. Eng. Assoc.
 NEW ENGLAND RAILROAD CLUB.—G. H. Frazier, 10 Oliver St., Boston, Mass.; 2d Tuesday in month, except June, July, Aug. and Sept., Boston.
 NEW YORK RAILROAD CLUB.—H. D. Vought, 95 Liberty St., New York; 3d Friday in month, except June, July and August, New York.
 NORTHERN RAILROAD CLUB.—C. L. Kennedy, C. & M. & St. P., Duluth, Minn.; 4th Saturday, Duluth.
 OMAHA RAILWAY CLUB.—H. H. Maulick, Barker Block, Omaha, Neb.; second Wednesday.
 RAILROAD CLUB OF KANSAS CITY.—C. Manlove, 1008 Walnut St., Kansas City, Mo.; 3d Friday in month, Kansas City.
 RAILWAY BUSINESS ASSOCIATION.—Frank W. Noxon, 2 Rector St., New York.
 RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Penna. R. R., Pittsburgh, Pa.; 4th Friday in month, except June, July and August, Pittsburgh.
 RAILWAY ELECTRICAL SUPPLY MANUFACTURERS' ASSOC.—J. Scribner, 1021 Monadnock Block, Chicago. Meetings with Assoc. Ry. Elec. Engrs.
 RAILWAY GARDENING ASSOCIATION.—J. S. Butterfield, Lee's Summit, Mo.; next meeting, August 13-16, Roanoke, Va.
 RAILWAY INDUSTRIAL ASSOCIATION.—G. L. Stewart, St. L. S. W. Ry., St. Louis, Mo.; annual, May 12, 1912, Kansas City, Mo.
 RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, Bethlehem, Pa.
 RAILWAY STOREKEEPERS' ASSOCIATION.—J. P. Murphy, Box C, Collinwood, Ohio. Convention, May 20-22, Buffalo, N. Y.
 RAILWAY SUPPLY MANUFACTURERS' ASSOC.—J. D. Conway, 2135 Oliver Bldg., Pittsburgh, Pa. Meetings with M. M. and M. C. B. assocs.
 RAILWAY TEL. & TEL. APPLIANCE ASSOC.—W. E. Harkness, 284 Pearl St., New York. Meetings with Assoc. of Ry. Teleg. Sups.
 RICHMOND RAILROAD CLUB.—F. O. Robinson, Richmond, Va.; 2d Monday, except June, July and August.
 ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—L. C. Ryan, C. & N. Y., Sterling; September, 1912, Buffalo, N. Y.
 ST. LOUIS RAILWAY CLUB.—B. W. Fraumenthal, Union Station, St. Louis, Mo.; 2d Friday in month, except June, July and Aug., St. Louis.
 SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmonds, 3868 Park Ave., New York. Meetings with annual convention Railway Signal Association.
 SOCIETY OF RAILWAY FINANCIAL OFFICERS.—C. Nyquist, La Salle St. Station, Chicago.
 SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—E. W. Sandwich, A. & W. P. Ry., Montgomery, Ala.
 SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grant bldg., Atlanta, Ga.; 3d Thurs., Jan., March, May, July, Sept., Nov., Atlanta.
 TOLEDO TRANSPORTATION CLUB.—J. G. Macomber, Woolson Spice Co., Toledo, Ohio; 1st Saturday, Toledo.
 TRAFFIC CLUB OF CHICAGO.—Guy S. McCabe, La Salle Hotel, Chicago; meetings monthly, Chicago.
 TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 290 Broadway, New York; last Tuesday in month, except June, July and August, New York.
 TRAFFIC CLUB OF PITTSBURGH.—D. L. Wells, Erie, Pittsburgh, Pa.; meetings monthly, Pittsburgh.
 TRAIN DESPATCHERS' ASSOCIATION OF AMERICA.—J. F. Mackie, 7042 Stewart Ave., Chicago; annual, June 18, 1912, Louisville, Ky.
 TRANSPORTATION CLUB OF BUFFALO.—J. M. Sells, Buffalo; first Saturday after first Wednesday.
 TRANSPORTATION CLUB OF DETROIT.—W. R. Hurley, L. S. & M. S., Detroit, Mich.; meetings monthly.
 TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, N. Y. C. & H. R., East Buffalo, N. Y.; August, 1912.
 WESTERN CANADA RAILWAY CLUB.—W. H. Rosevear, P. O. Box 1707, Winnipeg, Man.; 2d Monday, except June, July and August, Winnipeg.
 WESTERN RAILWAY CLUB.—J. W. Taylor, Old Colony building, Chicago; 3d Tuesday of each month, except June, July and August.
 WESTERN SOCIETY OF ENGINEERS.—J. H. Warder, 1735 Monadnock Block, Chicago; 1st Monday in month except July and August, Chicago.

Traffic News.

The Denver & Rio Grande is to run an agricultural demonstration train on its lines in Utah, beginning February 20, carrying lecturers from the state agricultural college.

It is reported that the shippers of Spokane, Wash., have abandoned their plans for a boycott of the Hill Lines as being impracticable, but they are continuing the campaign for subscriptions for a fund to prosecute their contest for lower freight rates.

The Long Island Railroad has notified the newspapers of New York City that the general superintendent and the superintendent may be called by telephone, either day or night, whether they may be at their offices or at their houses, for the purpose of securing the essential facts of accidents or interruption of traffic.

The Atlantic Coast Line has started a "good roads" train which made its first trip on Wednesday last, and which is to traverse the company's lines throughout the State of Florida, making stops for the delivery of lectures on every week day until February 23. Models of road-making machinery will be exhibited in operation.

Five suits have been filed in the United States district court at Cincinnati for violations of the federal 28-hour law in the transportation of live stock. The defendants are the Covington & Cincinnati Elevated Railroad Transportation & Bridge Company, Baltimore & Ohio Southwestern, Cincinnati, Hamilton & Dayton and Cincinnati, New Orleans & Texas Pacific.

The Missouri Pacific has placed in operation between Kansas City and Hot Springs a new passenger train to be known as the "Kansas City-Hot Springs Express," under a schedule several hours faster than the best previously in effect. The train leaves Kansas City at 6:20 p. m. and arrives in Hot Springs the next day at 2:25 p. m. Returning it leaves Hot Springs at 11:30 a. m. and arrives in Kansas City at 7:30 the next morning.

The Secretary of War, after listening to protests from a committee representing the Pacific Coast, has postponed until February 15 the proposed increase in freight rates over the Panama road, and the steamship line between New York and Colon. The order to increase the rates was made because the work on the construction of the Panama Canal has been delayed by the heavy movement of freight over the railway. Besides this, the earnings of the railway and the steamship line for the quarter ending September 30 were not satisfactory.

George J. Charlton, passenger traffic manager of the Chicago & Alton, has been elected chairman of the executive committee of the Western Passenger Association for the ensuing year, succeeding A. L. Craig, general passenger agent of the Chicago Great Western. Mr. Charlton is following in the footsteps of his father, James Charlton, now chairman of the Transcontinental Passenger Association, who was the first president of the executive committee of the Western Passenger Association and served in that capacity for several years, and who was also general passenger agent of the Chicago & Alton from 1871 to 1900.

The extension of the Ocala Northern to Palatka, Fla., was opened for regular passenger and freight traffic on January 26, with two passenger trains each way daily. The whole length of the road is now open, Ocala to Palatka, 53 miles. At Palatka connection is made with the Atlantic Coast Line, the Georgia Southern & Florida, and the Florida East Coast. The railway trip from Ocala to Palatka is now 29 miles shorter than heretofore. Since this road was projected, 150,000 acres of land tributary to the line in Marion and Putnam counties have changed hands. The road has 4 locomotives, 6 passenger cars and 30 freight cars.

In the United States District Court at New York City, January 29, J. E. Bernard, M. Ascher, A. Bontaux and O. F. Kosche, all of Chicago, pleaded not guilty to indictments charging them with using false descriptions of merchandise received from foreign countries and shipped west by railway from New York. The same men were already held in \$5,000 each on indictments

charging them with having received rebates from the railways, and new bail bonds of \$2,500 each were required. One of the charges was that skeletons, on which the charge is \$2.25 per 100 lbs., were shipped as "natural history specimens," on which the rate would be 75 cents.

A conference between the National Baggage Committee, representing the commercial interests, and passenger and baggage officers of the railways, representing the various passenger traffic associations, was held at St. Louis on January 22 at the request of the shippers, for the purpose of discussing the demands of the committee for a readjustment of excess baggage charges in the direction of uniformity. It was decided to submit the question to a joint committee of seven railway officers and seven representatives of the shippers, which will hold further conferences on the entire subject of excess baggage rules, with particular reference to the recent efforts of the roads to limit the size of trunks.

Export Rate Hearing.

The Interstate Commerce Commission continued at Washington, January 24, 25 and 26, the hearing on the complaint of the Merchants' Association of New York, regarding export and import freight rates. Representatives of Baltimore and Philadelphia complained that in spite of the differentials now in force, New York does 61 per cent. of the export and import business going through Atlantic ports. C. R. Lewis, agent of the Cleveland, Cincinnati, Chicago & St. Louis, at Indianapolis, said that in the last year the export grain shipped from Indianapolis, went, 23 per cent. to Philadelphia, 52 per cent. to Baltimore, 18 per cent. to Newport News, and 6.3 per cent. to New York.

D. L. Irwin, of Philadelphia, said that at Philadelphia there were three grain exporting firms, including his own, while in New York there were seven or eight times that number. Philadelphia has the disadvantage of not having regular steamship sailings. Evidence was produced to show that on iron and steel shipped from Pittsburgh to Atlantic ports, the rates are the same to all ports.

The counsel for the Merchants' Association thought that the way to eliminate the differentials would be to reduce the New York rate to the basis of the Baltimore; but the representative of the Pennsylvania Railroad thought that it would be better to advance the rates of the other ports to the level of New York.

The Pennsylvania Railroad introduced a statement to the effect that in 1898 New York had 66.35 per cent. of the total export and import business passing through the six principal Atlantic ports; from 1899 to 1903 it had 68 per cent.; from 1904 to 1908, 72.47 per cent.; in 1909, 75 per cent.; in 1910, 75 per cent.; and in 1911, 77.53 per cent.

Representatives of the Boston Chamber of Commerce presented evidence that, having rates the same as New York, Boston could not hold its export trade as against Baltimore and Philadelphia. Boston asks for rates the same as those through Baltimore. The export business through Boston is decreasing.

Controversy Over Revised Western Classification.

The suspension board of the Interstate Commerce Commission held a preliminary hearing at Chicago on Monday, January 29, for the purpose of receiving the testimony of shippers who have asked the suspension of Western Classification No. 51, which is effective February 15. Members or attorneys of nine state railway commissions presented petitions asking that the entire classification be suspended for 120 days, declaring that advances had been made on 850 articles and reductions in 680, and that they would require time to determine the effect of the changes and present formal complaints. G. N. Brown, chief examiner for the commission, made it clear at the start that this was simply a preliminary hearing for the purpose of enabling the commission to determine whether any part of the classification should be suspended and that he did not care to hear general arguments for the suspension of the entire classification, but would first hear from shippers who had complaints on specific items. The general complaints he said would be heard later. The state railway commissioners thereupon withdrew, and after conference gave to the newspapers a statement that the chief examiner had prejudged their case, and that the railways were seeking to secure advances in millions of rates "by subterfuge." A large propor-

tion of the changes made in the classification comprise the recommendations of the Uniform Classification Committee, adopted at the Milwaukee meeting of the Western Classification Committee last summer, and affect rules, minimum weights and descriptions of articles without directly changing the ratings of the commodities.

Representatives of agricultural implement dealers and manufacturers protested against rule 6 B of the classification, which contains a sliding scale of minimum weights on agricultural implements, declaring that on the average they could not load 24,000 lbs. in a 36-ft. car, as provided by the rule. R. C. Fyfe, chairman of the Western Classification Committee, replied with a long statement of car records secured both from shippers and railways, showing actual instances in which far greater weights had been loaded in cars of this size without filling the cars. A large number of dealers also objected strongly to the elimination of binder twine from the agricultural implement list, on the

Car Surpluses and Shortages.

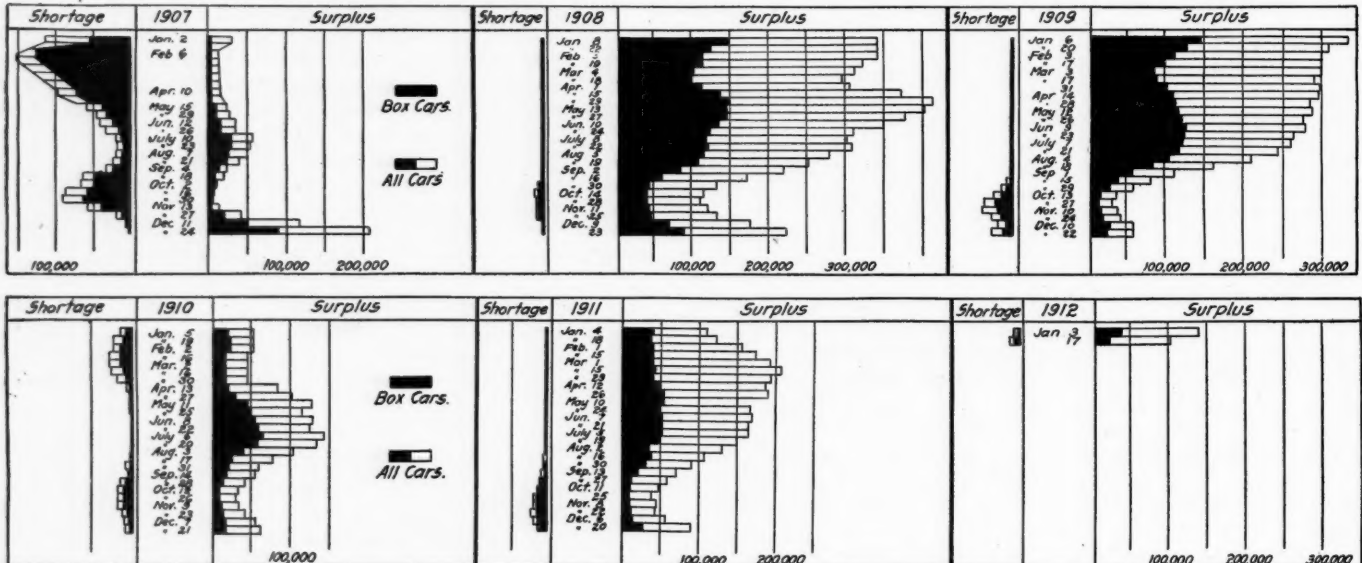
Arthur Hale, chairman of the committee on relations between railways of the American Railway Association in presenting statistical bulletin No. 111-A, giving a summary of car shortages and surpluses by groups from September 28, 1910, to January 17, 1912, says:

"The total car surplus for the period ended January 17, 1912, is 102,479 cars as against a total of 142,316 cars on January 3, 1912, a decrease of 39,837 cars. This decrease is obviously due to the cold weather. The total coal car surplus reported on January 3, 1912, was 64,719 cars, while the report of January 17, 1912, shows a total of 42,770 cars, a decrease of 21,949 cars or about 65 per cent. of the total decrease for the period covered by this report. There are also decreases reported in box and miscellaneous cars, the former decreasing 13,034 cars, and the latter 5,128 cars. Flat cars show an increase of 274 cars.

It will be noted that the total car surplus has not been reduced

CAR SURPLUSES AND SHORTAGES.												
Date.		No. of roads.	Surpluses				Shortages					
			Box.	Flat.	Coal, gondola and hopper.	Other kinds.	Total.	Box.	Flat.	Coal, gondola and hopper.	Other kinds.	Total.
Group *1.—	January 17, 1912.....	7	19	2,136	2,237	115	4,507	333	0	0	65	398
"	2.— " 17, 1912.....	25	3,141	309	11,384	6,137	20,971	7	0	0	12	19
"	3.— " 17, 1912.....	25	4,827	1,394	17,873	3,068	27,162	546	0	275	119	940
"	4.— " 17, 1912.....	11	1,782	742	1,867	1,179	5,570	108	0	2,000	0	2,108
"	5.— " 17, 1912.....	19	1,588	235	2,601	1,086	5,510	120	73	72	115	380
"	6.— " 17, 1912.....	23	1,300	936	2,259	3,435	7,930	1,930	80	228	8	2,246
"	7.— " 17, 1912.....	3	0	183	27	97	307	258	0	0	49	307
"	8.— " 17, 1912.....	19	2,299	403	1,616	2,027	6,345	165	15	0	1	181
"	9.— " 17, 1912.....	10	3,540	78	537	911	5,066	0	17	0	12	29
"	10.— " 17, 1912.....	20	4,612	2,498	2,369	9,025	18,504	175	0	0	28	203
"	11.— " 17, 1912.....	5	3	364	0	240	607	5,228	0	0	155	5,383
Total		167	23,111	9,278	42,770	27,320	102,479	8,870	185	2,575	564	12,194

*Group 1 is composed of New England lines; Group 2—New York, New Jersey, Delaware, Maryland, and Eastern Pennsylvania lines; Group 3—Ohio, Indiana, Michigan and Western Pennsylvania lines; Group 4—West Virginia, Virginia, North and South Carolina lines; Group 5—Kentucky, Tennessee, Mississippi, Alabama, Georgia and Florida lines; Group 6—Iowa, Illinois, Wisconsin, Minnesota and the Dakotas lines; Group 7—Montana, Wyoming and Nebraska lines; Group 8—Kansas, Colorado, Missouri, Arkansas and Oklahoma lines; Group 9—Texas, Louisiana and New Mexico lines; Group 10—Oregon, Idaho, California and Arizona lines; Group 11—Canadian lines.



Car Surpluses and Shortages in 1907 to 1912.

ground that to deny them the privilege of mixing twine with agricultural implements would work a great hardship and require them to pay less than carload rates on both agricultural implements and twine. Mr. Fyfe argued that binder twine is in no sense an agricultural implement and showed that the price of the twine in less-than-carload lots was usually made one-fourth of a cent a pound over the carload price, although the rate made practically no difference per pound. For example, he cited the rates from Chicago to St. Paul, 20 cents per 100 lbs. in carloads and 25 cents for less than carloads, a difference of one-twentieth of a cent a pound. After some discussion Mr. Fyfe agreed to a restoration of the mixing privilege, because many dealers had already made their contracts for a season's supply on the former basis. Various compromises were also made on other items.

below the figures reported as of December 20, 1911—88,646 cars. The car shortage increased nearly 100 per cent., the total shortage for this report being 12,194 cars. The increase in shortage is chiefly in box and coal cars, these two classes increasing 2,917 cars and 2,487 cars respectively, while increases of 81 cars and 331 cars are reported in flat and miscellaneous cars."

The accompanying table gives car surplus and shortage figures by groups for the last period covered in the report, and the diagrams show total bi-weekly surpluses and shortages in the years from 1907 to 1911.

Total Railway Earnings.

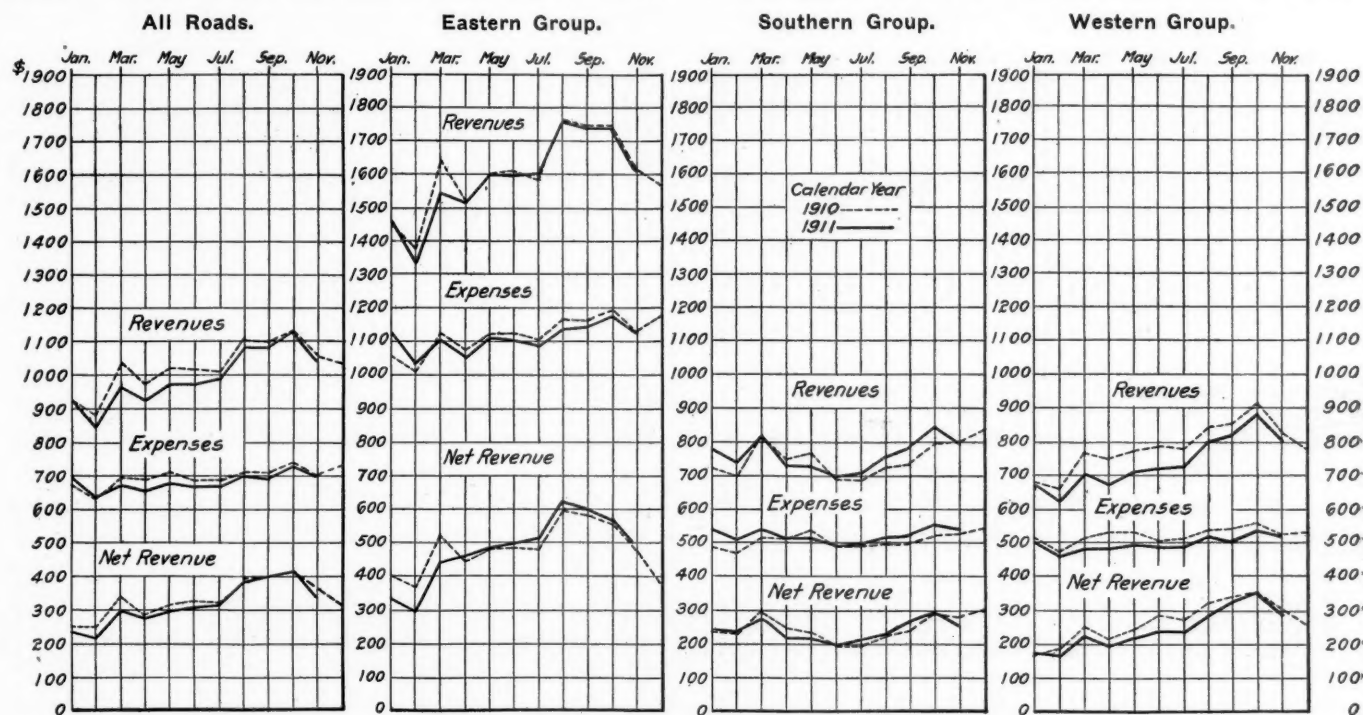
The summary of revenues and expenses of steam roads in the United States for the month of November, 1911, prepared by Bureau of Railway Economics, shows that the railways whose

returns are included operate 222,900 miles of line, or about 90 per cent. of all the steam railway mileage in the United States. The total operating revenues for the month of November, 1911, amounted to \$234,854,512. Compared with November, 1910, the total operating revenues of these railways show a decrease of \$1,335,425. Operating revenues per mile of line amounted to \$1,054 in November, 1911, and \$1,071 in November, 1910, a decrease for 1911 of \$18, or 1.6 per cent. This decrease in operating revenues resulted from decreases both in freight and in passenger revenues.

Operating expenses amounted to \$157,591,429. This was \$1,261,441 more than for November, 1910, but was due exclusively to the increase in mileage of roads in 1911. Operating expenses per mile of line amounted to \$707 in November, 1911, and \$709 in November, 1910, a decrease for 1911 of \$2 per mile, or 0.3 per

cent. traffic expenses, 5.7 per cent.; transportation expenses, 6.9 per cent. general expenses, 5.9 per cent. On the western railways there were decreases as follows: maintenance of way and structures, 5.1 per cent.; maintenance of equipment, 2.0 per cent.; transportation expenses, 1.4 per cent.; general expenses, 3.8 per cent. Traffic expenses increased 8.1 per cent. All the groups show decreases in net operating revenue per mile. In the eastern group this net revenue per mile decreased 0.7 per cent. as compared with November, 1910; in the southern group there was a decrease of 5.8 per cent.; in the western group a decrease of 7.0 per cent. Taxes increased in all the groups as compared with November, 1910, the increase per mile amounting to 15.0 per cent. in the eastern group, 3.2 per cent. in the southern group, and 12.7 per cent. in the western group.

The accompanying diagram compares monthly earnings in 1910



Total Monthly Per Mile Earnings and Expenses of Railways.

cent. In the cost of maintaining way and structures, there was a decrease compared with November, 1910, of \$2.40 per mile, or 1.9 per cent.; in the cost of maintaining equipment an increase of 10 cents per mile; in traffic expenses an increase of 32 cents per mile, or 1.6 per cent.; in the cost of conducting transportation a decrease of 8 cents per mile; general expenses showed an increase per mile of 7 cents, or 0.3 per cent.

Net operating revenue shows a decrease as compared with November, 1910, of \$16 per mile, or 4.3 per cent. The net revenue for each mile of line for each day in November averaged \$11.55, as compared with \$12.07 for November, 1910. Taxes for the month of November amounted to \$9,676,976, or \$43 per mile, an increase of 12.7 per cent. over November, 1910.

The operating ratio for November was 67.1 per cent., as compared with 63.9 in October, 1911, and 66.2 per cent. in November, 1910.

The eastern group of railways show a decrease in total operating revenues per mile as compared with November, 1910, of 0.3 per cent., and the western group a decrease of 3.9 per cent., while the operating revenues per mile of the southern group increased 1.1 per cent. over November, 1910. Operating expenses per mile decreased 0.1 per cent. on the eastern railways as compared with November, 1910, and on the western railways 2.0 per cent., but increased on the southern railways 4.8 per cent. On the eastern group there were slight increases in the cost of maintaining way and structures and of maintaining equipment, and a slight decrease in transportation expenses. Traffic expenses decreased 5.8 per cent., while general expenses increased 2.4 per cent. On the southern railways, there were increases in each primary operating expense account, as follows: maintenance of way and structures, 0.8 per cent.; maintenance of equipment, 4.0 per cent.;

and 1911. The following table shows what per cent. of total revenues is consumed by each class of expense.

PERCENTAGE OF TOTAL OPERATING EXPENSES.

	Novem- ber, 1911.	Novem- ber, 1910.	Fiscal year ended June 30, 1911.	Fiscal year ended June 30, 1910.
Maint. of way and structures.	11.9	11.9	13.1	13.4
Maint. of equipment.	15.4	15.2	15.3	15.0
Traffic	2.0	1.9	2.1	2.0
Transportation expenses	35.4	34.8	35.5	33.4
General expenses	2.4	2.4	2.6	2.5
Total operating expenses.	67.1	66.2	68.6	66.3

INTERSTATE COMMERCE COMMISSION.

The Atlanta Freight Bureau has filed with the commission a complaint alleging excessive freight charges on many commodities from New York and other eastern cities to Atlanta.

Commissioner B. H. Meyer on January 26 conducted a hearing at Chicago on complaint of the Milwaukee brewing companies against the rates on return shipments of empty beer kegs from California and other western points to Milwaukee.

The commission resumed this week at Washington its general inquiry concerning the business and methods of the large express companies. Following the sittings at which the representatives of shippers were heard, the commission sent to each express company a long list of questions outlining the course which would be taken in the hearings at which the express companies will be heard. These questions go minutely into all features of the express companies' business.

REVENUES AND EXPENSES OF RAILWAYS.

MONTH OF NOVEMBER, 1911.

Mileage operated at end of period.	Name of road.	Operating revenues			Way and structures.		Maintenance		Operating expenses			Net operating revenue (or deficit).	Outside operations, net.	Taxes.	Operating income (or loss).	Increase (or decrease) last year.
		Freight.	Passenger.	Total.	Of equipment.	Traffic.	Transportation.	General.	Total.							
92	Atlanta & West Point.....	\$58,037	\$39,415	\$199,837	\$14,652	\$25,043	\$4,520	\$36,903	\$3,825	\$84,943	\$24,894	\$3,208	\$5,189	\$19,913	\$14,074	\$14,173
661	Atlanta, Birmingham & Atlantic.....	218,936	35,672	287,015	32,533	48,417	13,985	105,521	11,042	121,498	73,517	4,138	15,767	57,767	213,498	4,138
166	Atlantic City.....	67,456	47,110	121,350	31,883	12,431	13,692	73,421	7,424	73,421	86	4,560	11,474	2,966	11,474	2,966
166	Atlantic & St. Lawrence.....	90,116	22,598	122,714	28,675	18,077	4,418	54,378	3,052	108,600	13,789	6,659	7,130	5,808	7,130	5,808
21	Belt Ry. Co. of Chicago.....	.....	.....	.....	14,958	24,227	.....	85,479	5,514	131,263	92,964	.....	6,559	87,464	17,641	17,641
265	Buffalo & Susquehanna R. R.....	146,247	8,500	160,020	28,322	27,678	1,364	60,394	5,911	123,669	36,351	.....	2,600	33,751	14,173	14,173
91	Buffalo & Susquehanna R. R.....	50,666	25,368	81,764	21,403	17,074	4,084	40,087	4,084	89,031	7,277	.....	7,000	14,277	19,564	19,564
233	Canadian Pacific Lines in Maine.....	230,567	76,778	307,345	42,797	62,718	8,786	165,467	8,561	288,279	47,190	.....	12,200	35,028	31,542	31,542
411	Central Vermont.....	1,601,855	404,187	2,006,042	316,219	351,377	52,146	732,298	50,706	1,502,946	587,671	.....	78,000	302,886	172,783	172,783
2,553	Denver & Rio Grande.....	115,023	45,311	189,334	17,066	24,325	7,654	103,610	4,524	157,179	32,151	.....	2,879	29,256	8,024	8,024
190	Detroit, Grand Haven & Milwaukee.....	307	217,693	79,096	19,626	39,149	11,066	131,540	8,107	209,488	107,757	.....	2,100	105,657	10,968	10,968
395	Georgia Southern & Florida.....	111,317	63,633	206,005	18,525	35,301	7,441	77,897	10,193	149,357	56,648	.....	12,532	44,116	2,010	2,010
347	Grand Trunk Western.....	329,434	161,940	491,374	52,648	84,610	20,720	219,944	12,264	392,977	130,671	.....	31,635	97,888	8,041	8,041
1,159	International & Great Northern.....	851,243	215,075	1,066,318	92,883	110,296	28,346	393,064	30,385	654,974	473,650	.....	33,000	440,512	.....	.....
102	Indiana Harbor Belt.....	.....	.....	199,667	30,468	23,753	2,935	89,086	13,778	160,020	39,647	.....	5,500	34,332	782	782
175	Kanawha & Michigan.....	235,574	27,186	262,760	38,075	48,595	2,108	84,274	6,044	179,096	88,536	.....	8,715	79,817	9,641	9,641
809	Kansas City, Mexico & Orient.....	192,829	54,735	247,564	19,829	36,621	7,370	75,869	10,029	160,254	32,575	.....	7,000	14,277	19,564	19,564
207	Louisiana Western.....	98,229	54,735	152,964	13,699	18,525	7,850	55,998	6,381	117,626	44,998	.....	12,200	35,028	31,542	31,542
3,769	Memphis, St. Paul & S. Ste. Marie.....	1,670,313	478,465	2,148,778	216,529	279,854	42,507	738,026	41,655	1,338,571	944,191	.....	140,844	808,510	186,958	186,958
3,915	Missouri Pacific.....	1,532,647	358,789	1,891,436	366,298	366,298	59,682	997,626	67,240	1,857,221	214,868	.....	82,600	127,586	574	574
404	Morgan's La. & Tex. R. & S. S. Co.....	405,548	97,293	502,841	55,644	62,583	13,646	211,088	12,053	355,014	178,556	.....	18,698	158,402	97,661	97,661
165	Nevada Northern.....	97,612	9,488	107,100	13,054	15,905	1,677	24,200	3,354	56,680	53,150	.....	4,743	48,407	24,807	24,807
264	New Orleans, Texas & Mexico.....	131,158	18,514	149,672	156,999	26,286	4,037	60,115	7,614	140,988	46,011	.....	1,552	44,459	2,135	2,135
416	Northwestern Pacific.....	130,100	128,678	258,778	47,266	47,266	2,965	111,449	9,225	211,770	69,225	.....	12,855	56,370	25,465	25,465
1,014	Philadelphia & Reading.....	3,274,396	561,893	3,836,289	4,002,972	363,735	37,702	1,230,772	61,325	2,340,785	1,662,187	.....	90,162	1,619,220	58,464	58,464
21	Port Reading.....	120,848	121,726	242,574	6,871	1,121	30	26,772	69,366	33,760	97,966	.....	3,800	92,166	21,481	21,481
3,314	St. Louis, Iron Mountain & Southern.....	2,100,048	501,666	2,601,714	2,788,185	490,995	53,535	838,347	69,366	1,810,700	973,486	.....	81,765	885,492	77,622	77,622
3,053	Seaboard Air Line.....	1,400,159	385,506	1,785,665	1,983,637	295,540	59,783	696,761	61,335	1,380,992	602,645	.....	75,000	524,899	99,065	99,065
550	Spokane, Portland & Seattle.....	276,860	126,767	403,627	34,927	43,739	7,447	104,979	11,849	202,841	224,609	.....	32,200	192,533	99,065	99,065
1,884	Texas & Pacific.....	1,400,323	334,458	1,734,781	152,656	170,578	32,463	708,942	40,810	1,105,449	720,054	.....	124,872	591,363	20,119	20,119
128	Utah & Delaware.....	67,046	16,308	83,354	10,385	11,697	1,001	39,546	2,355	64,984	22,543	.....	3,300	19,459	7,906	7,906
2,514	Wabash.....	1,682,060	560,216	2,242,276	301,488	404,163	75,644	1,055,570	73,803	1,910,668	523,639	.....	71,655	449,277	176,723	176,723
543	Western Maryland.....	483,850	61,193	545,043	70,774	69,533	8,798	205,625	13,123	307,853	202,776	.....	21,000	181,776	2,428	2,428
934	Western Pacific.....	435,286	92,816	528,102	88,514	45,538	25,292	207,586	23,606	390,536	151,392	.....	14,550	132,649	.....	.....
133	Western Ry. of Alabama.....	68,034	39,440	107,474	19,525	23,610	6,491	29,322	6,586	85,534	33,086	.....	4,612	28,316	220	220
FIVE MONTHS OF FISCAL YEAR, 1912.																
92	Atlanta & West Point.....	\$281,812	\$209,444	\$491,256	\$64,888	\$104,066	\$24,521	\$158,837	\$24,314	\$376,626	\$163,798	\$888	\$25,946	\$138,740	\$6,296	\$6,296
661	Atlanta, Birmingham & Atlantic.....	1,005,205	306,434	1,311,639	143,635	219,214	81,263	489,460	47,279	980,851	398,248	.....	63,550	334,698	98,395	98,395
166	Atlantic City.....	349,623	739,189	1,088,812	1,143,668	125,845	65,992	15,482	494,163	7,322	708,504	435,164	.....	378,745	25,157	25,157
166	Atlantic & St. Lawrence.....	376,988	150,569	527,557	583,206	202,148	103,779	201,548	14,760	582,933	273	.....	33,293	33,293	10,024	10,024
21	Belt Ry. Co. of Chicago.....	.....	.....	.....	1,129,402	127,887	3,192	396,981	31,809	630,140	151,151	.....	27,500	468,341	25,561	25,561
265	Buffalo & Susquehanna R. R.....	694,987	49,032	744,019	160,912	141,972	7,147	278,300	31,809	620,140	151,151	.....	13,000	138,151	9,770	9,770
91	Buffalo & Susquehanna R. R.....	216,966	53,934	270,900	32,298	134,522	2,536	116,450	12,791	298,597	161,760	.....	7,000	24,034	31,533	31,533
233	Canadian Pacific Lines in Maine.....	237,016	102,784	339,800	123,699	69,744	25,798	161,884	17,470	398,595	29,431	.....	35,000	64,431	18,270	18,270
411	Central Vermont.....	1,129,693	553,301	1,682,994	230,999	263,973	40,297	786,327	43,054	1,364,650	457,992	.....	60,100	401,671	3,740	3,740
2,553	Denver & Rio Grande.....	7,767,900	2,540,659	10,308,559	1,822,642	1,779,947	279,647	3,621,822	245,661	7,562,899	3,192,822	.....	364,000	2,836,611	598,933	598,933
190	Detroit, Grand Haven & Milwaukee.....	576,745	315,668	892,413	1,024,005	119,707	25,422	456,584	21,979	761,690	262,315	.....	14,399	247,639	88,536	88,536
395	Georgia Southern & Florida.....	979,742	403,377	1,383,119	1,468,269	122,384	55,664	600,781	40,050	1,023,107	445,162	.....	10,500	434,662	105,514	105,514
307	Grand Trunk Western.....	521,881	353,280	875,161	1,011,516	101,878	34,148	385,432	47,201	757,353	254,163	.....	50,160	204,003	4,752	4,752
347	International & Great Northern.....	1,663,619	1,012,329	2,676,048	2,856,969	371,772	97,704	1,092,999	65,415	2,044,717	812,252	.....	158,176	650,764	193,716	193,716
1,159	Indiana Harbor Belt.....	.....	.....	.....	1,062,733	134,581	14,592	456,888	39,963	785,850	276,883	.....	82,500	1,173,578	.....	.....
175	Kanawha & Michigan.....	1,296,091	157,197	1,453,288	180,679	228,766	11,299	424,925	32,824	878,493	601,542	.....	27,500	271,299	103,266	103,266
809	Kansas City, Mexico															

Special Examiner Prouty, of the Interstate Commerce Commission, conducted a hearing in St. Louis last week on a complaint of the St. Louis lumber dealers that a recent advance in freight rates on lumber from points in the Southwest to St. Louis constitute a discrimination against St. Louis to the extent of one cent per 100 lbs.

Commissioner James S. Harlan began a hearing at Detroit, Mich., on January 24, on the complaint of the Duluth (Minn.) Commercial Club, that the present structure of lake-and-rail rates from eastern points is discriminatory against Duluth and unduly preferential to St. Paul, Minneapolis and Lake Michigan ports. The complaint also attacks the rates to Duluth as excessive in themselves, and alleges that the privilege of free storage in transit on through shipments at Duluth and lake ports for the purpose of reconsignment is discriminatory. G. Roy Hall, traffic commissioner of the Duluth Commercial Club, contended that rates through Duluth should be made to break at that point, and that a local rate should be charged between Duluth and the Twin Cities.

Refund Ordered.

Continental Iron & Steel Co. v. Louisville & Nashville. Opinion by the commission.

A rule in southern classification was wrongly interpreted to require bridge material to be broken in pieces before being given the scrap iron rate, with the resulting overcharge. (22 I. C. C., 281.)

Discrimination Against Cotton Waste.

South Atlantic Waste Co. v. Southern Railway et al. Opinion by the commission.

A C. L. rate of 46 cents per 100 lbs. on cotton waste from Charlotte, N. C., to New York, is found to be discriminatory as compared with the rate on cotton goods. (22 I. C. C., 293.)

Reparation Awarded.

Davis Sewing Machine Co. v. Pittsburgh, Cincinnati, Chicago & St. Louis. Opinion by the commission.

Bicycles were given the second-class rate in official classification up to July 1, 1910, and then given the first-class rate. The defendants failed to justify the advanced rating, and former rates were restored. (22 I. C. C., 291.)

Wells-Higman Co. v. St. Louis, Iron Mountain & Southern et al. Opinion by the commission.

The C. L. rate of 94 cents per 100 lbs. for fruit baskets from Wynne, Ark., to Horatio via Texarkana, Tex., should not have been advanced more than 50 cents per 100 lbs. (22 I. C. C., 288.)

Eldorado Oil Mills & Fertilizer Co. v. Chicago, Rock Island & Pacific. Opinion by the commission.

The C. L. rate of 7½ cents per 100 lbs. on acid phosphate from Ruston, La., to Eldorado, Ark., reduced to five cents. (22 I. C. C., 286.)

STATE COMMISSIONS.

The Washington state railway commission has issued an order permitting the Northern Pacific to disregard the state long-and-short law clause so far as it affects Puget Sound territory.

Tariffs of rates for switching freight cars promulgated by the New Hampshire Public Service Commission having been objected to, the commission has begun an inquiry and will take testimony as to the reasonableness of the rates.

The Illinois railway commission has issued an order extending for 90 days from January 1, the period within which the railways of the state may continue to disregard the state long-and-short haul law. At the end of that time the commission will enter an order.

At Berlin, N. H., the State public service commission, in recommending the installation of gates at a highway crossing, has called upon the railway and municipality to have the tracks of the railway fenced in, and to take such other measures as are practicable to keep people from walking on the tracks.

The Oregon railway commission has issued orders prescribing distance freight tariffs, reducing the class rates between points in the state on the Oregon-Washington Railroad & Navigation Company and the Southern Pacific. Also an order was issued reducing the passenger rate on the Corvallis & Eastern to 3 cents a mile. The reductions are made to correspond to similar reductions recently ordered by the Interstate Commerce Commission and the Washington railway commission in the distributive rates from the Pacific coast cities to interior points.

The long pending complaints of citizens of Yonkers, Mount Vernon and other cities near New York, relative to the increases in season ticket fares which were made by the New Haven and the New York Central last summer, have been made the subject of further hearings by the New York Public Service Commission, Second district, during the past week. When the lawyers for the complainants started to make comparisons with the fares charged by the New Haven road in the Boston suburban district, Chairman Stevens, of the commission, refused to admit the argument, declaring that there was danger that the inquiry would never come to an end. He desired to have the case settled before the commissioners who began the hearings should go out of office. "We are trying to keep the record down to reasonable size. The conditions are different in all large cities. You cannot compare Boston with San Francisco, or New York with Chicago. There may be a law in Boston which requires a low rate; many conditions are involved, and because one road voluntarily may establish a losing rate at one point is no reason why the New York Central should be made to conform to a losing rate."

COURT NEWS.

Justice Mack, of the Court of Commerce, has been designated to sit in that court for another term of five years, his first term (of one year) having just expired.

In the Federal court at Montgomery, Ala., a report presented by Special Master W. S. Thorington on the Central-of-Georgia passenger rate case holds that as regards that road the Alabama law, fixing passenger fares at 2.5 cents a mile and limiting freight rates on 116 commodities, is null and void. This conclusion is similar to that which was reached sometime since in regard to the Louisville & Nashville.

United States Commerce Court.

The February docket of the United States Commerce Court contains 22 cases. The cases in which the court is asked to set aside orders of the Interstate Commerce Commission are as follows: Rail and water rates on shoes between Boston, New York and Atlanta; rates from Rock Island, Ill., to Des Moines, Iowa; class rates from Sacramento, Cal., to Nevada and Utah points west of Ogden; fixing class rates to Reno from eastern points; class rates from Kansas City, etc., to Phoenix, Ariz.; C. L. rates on beer to Leadville, Col.; rates from the southwest to Omaha, etc., on lumber; lighterage charges on sugar at New York; distinction in rates between railway fuel coal and other coal; local class rates from Roanoke, Va., to Winston-Salem, N. C., etc.; reduction from \$30 to \$7.50 in the charge for refrigeration of citrus fruits when pre-cooled by the shipper; reparation to the St. Louis Blast Furnace Company; reshipping privileges of grain and hay at Nashville, Tenn.; anthracite coal rates from Wyoming district of Pennsylvania to tidewater; rates between Salt Lake City, etc., and the Missouri river, etc.; no reparation to the Anaconda Copper Mining Company on coke shipped from West Virginia-Pennsylvania ovens to Chicago; the application of the Crane Railroad Company to be given the privileges of a common carrier [Tap line case]; the method of classification of expenditures for additions and betterments; rates on citrus fruits from gathering points in Florida to Jacksonville; rates on fir lumber from the Willamette valley to San Francisco; the Baltimore & Ohio's switch connections and traffic interchange with the Cincinnati & Columbus Traction. The other case is a petition for a writ of mandamus to compel the Louisville & Nashville and Southern Railway to furnish cars and move coal for the Stony Fork Coal Company.

Railway Officers.

ELECTIONS AND APPOINTMENTS.

Executive, Financial and Legal Officers.

W. D. Tucker has been appointed auditor of the Kansas City Terminal, with office at Kansas City, Mo., succeeding C. C. Ripley; resigned.

F. L. Paetzold has been appointed assistant secretary and fiscal agent of the Colorado Midland, with office at New York, succeeding L. E. Katzenbach, resigned.

R. B. Smith, treasurer and auditor of the Texas City Terminal Company, has been appointed auditor of the Wolvin Steamship Line, with office at Texas City, Tex.

Alfred S. Dutton, assistant auditor of freight accounts of the Michigan Central at Detroit, Mich., has been appointed auditor of freight accounts, succeeding Thomas Eedson, retired under the pension rules of the company, and William J. Daeschner succeeds Mr. Dutton.

A. C. Ridgway, assistant to second vice-president of the Chicago, Rock Island & Pacific, has been appointed acting vice-president in charge of the operating department at Chicago, succeeding F. O. Melcher, deceased, and W. S. Tinsman, general manager of the First district, has been appointed assistant to president in charge of special work. See an item under Operating Officers.

Edward L. Brown, general superintendent of the Western district of the Great Northern at Spokane, Wash., has been elected vice-president and general manager of the Denver & Rio Grande, with office at Denver, Colo. Finley J. Shepard, assistant to the vice-president of the Missouri Pacific, has been appointed assistant to the president of the Denver & Rio Grande, with office at Denver.

Colonel Henry C. Hudgins, assistant to the president of the Norfolk Southern, with office at Norfolk, Va., was retired on February 1. Mr. Hudgins was born on September 19, 1841, in Matthews county, Va., and attended the Virginia Collegiate Institute at Portsmouth, Va., from 1855 to 1860. Six years later he entered the service of the Baltimore Steam Packet Company as receiving clerk, and was then successively delivery clerk, manifest clerk and chief clerk. In 1870, he was appointed sub-agent to subsidiary lines of the Old Dominion Steamship Company, and was also manifest and rate clerk in the office of the main line at Norfolk until June, 1881. He then went to the Elizabeth City & Norfolk, now a part of the Norfolk Southern as agent, and was later promoted to general freight and passenger agent of that company and its successors, which position he held until his appointment on September 1, 1910, as assistant to the president of the Norfolk Southern.



H. C. Hudgins.

Operating Officers.

Frank Waterhouse has been appointed manager of the Grand Trunk Pacific Dock, with office at Seattle, Wash.

The office of F. L. Sheppard, general superintendent of the New Jersey division of the Pennsylvania, has been transferred from Jersey City, N. J., to the Pennsylvania station, New York.

Jesse G. June, assistant superintendent of terminals of the Erie Railroad at Jersey City, N. J., has been appointed superintendent of terminals, with office at Jersey City, succeeding J. M. Barrett, assigned to other duties.

James Osborne, general superintendent of the Ontario division of the Canadian Pacific at Toronto, Ont., has been appointed general superintendent of the Pacific division, with office at Vancouver, B. C.

W. H. Foster, trainmaster of the New York, New Haven & Hartford, at Taunton, Mass., has been appointed superintendent of the Old Colony division, succeeding A. Ross, resigned to go to another company. Robert T. Cronin succeeds Mr. Foster; George P. Snow has been appointed chief train dispatcher, and R. L. Stevens has been appointed night chief train dispatcher, all with offices at Taunton, Mass.

C. L. Rupert, superintendent of the Amarillo division of the Chicago, Rock Island & Gulf, at Amarillo, Tex., has been appointed superintendent of the Southern division, with office at Fort Worth, succeeding J. McGie, transferred. A. E. Walker, trainmaster at El Reno, Okla., succeeds Mr. Rupert, and H. V. Bray has been appointed trainmaster of the Southern division, with office at Fort Worth, succeeding L. E. McClure, resigned.

W. M. Whitenton, general manager of the Third district of the Chicago, Rock Island & Pacific, at Fort Worth, Tex., has been appointed general manager of the First district, with office at Chicago, succeeding W. S. Tinsman, promoted. C. W. Jones, general superintendent of the First district at Davenport, Iowa, succeeds Mr. Whitenton. F. J. Easley, superintendent of the Illinois division at Rock Island, Ill., succeeds Mr. Jones. H. L. Reed succeeds Mr. Easley. M. J. Kennelly has been appointed superintendent of the Missouri division, with office at Trenton, Mo., succeeding Mr. Reed. A. B. Ramsdell has been appointed superintendent of the St. Louis division, with office at Eldon, Mo., succeeding Mr. Kennelly, and C. B. Pratt has been appointed superintendent of the Chicago Terminal division, succeeding Mr. Ramsdell. See an item under Executive, Financial and Legal Officers.

J. F. Sheahan, master mechanic of the Georgia & Florida, at Douglas, Ga., who on January 1 was appointed assistant superintendent, began railway work in 1880, at the Renova shops of the Pennsylvania Railroad, and was later transferred to Camden, N. J. Previous to May, 1888, he held various positions, and was then appointed master mechanic of the Orange Belt Railway, now a part of the Atlantic Coast Line, and in July, 1895, became master mechanic of the Florida Southern at Palatka, Fla. He was then for eight months master mechanic on the Plant System. In June, 1897, he was made night round-house foreman of the Southern Railway. The following August he was appointed erecting shop foreman, and one month later became general foreman at Alexander, Va. He was promoted to master mechanic of the Southern Railway in January, 1900, at Selma, Ala., and then served in the same capacity consecutively at Columbia, S. C., Spencer, N. C., Atlanta, Ga., and Knoxville, Tenn. Mr. Sheahan left the service of the Southern Railway in January, 1910, and went to the International & Great Northern as master mechanic at Palestine, Tex. In December, 1911, he was appointed master mechanic of the Georgia & Florida, with office at Douglas, Ga., and on January 1, 1912, when the Hine system of organization was established by the Georgia & Florida, he became assistant superintendent, with office at Douglas.



J. F. Sheahan.

W. D. Scott, general superintendent of the Eastern district of the Great Northern at St. Paul, Minn., has been appointed general superintendent of the Western district, with office at Seattle, Wash., succeeding E. L. Brown, resigned to accept service with

another company. Frank Bell, assistant general superintendent of the Eastern district at St. Paul, succeeds Mr. Scott, and C. E. Leverich, superintendent of the Minot division at Minot, N. D., succeeds Mr. Bell, with office at Grand Forks, N. D. R. A. McCandless, assistant superintendent of the Minot division, succeeds Mr. Leverich, and J. S. Landis has been appointed trainmaster of the Minot division, with headquarters at Minot.

J. McGie, superintendent of the Chicago, Rock Island & Gulf, at Fort Worth, Tex., has been appointed superintendent of the Oklahoma division of the Rock Island Lines, with office at El Reno, Okla., succeeding H. M. Hallock, resigned. K. H. Hanger has been appointed trainmaster of the Oklahoma division, with office at El Reno, Okla., succeeding T. S. Barnes, resigned to go to another company. H. G. Clark, trainmaster at Little Rock, Ark., has been appointed trainmaster, with office at El Reno, succeeding A. E. Walker, promoted. H. Fairmon, trainmaster at Eldorado, Ark., succeeds Mr. Clark. The position of terminal trainmaster at Little Rock, Ark., has been abolished, and the jurisdiction of the general agent at that place is extended to include Little Rock terminals. The position of trainmaster and roadmaster for the territory from Winfield, La., to Eunice is also abolished, and H. F. Clark has been appointed trainmaster of the Louisiana division, with office at Eldorado, Ark., succeeding H. Fairmon, transferred.

Traffic Officers.

W. R. Miller, traveling freight agent of the Kanawha Despatch at St. Louis, Mo., has been transferred to Kansas City, Mo.

J. J. Carroll has been appointed agent of the Grand Trunk Pacific Coast Steamship Company, Ltd., with office at Seattle, Wash.

E. L. Harrington has been appointed traveling freight agent of the Baltimore & Ohio Southwestern, with office at Dallas, Tex., succeeding C. A. Waterman, resigned.

F. A. Nelson has been appointed traffic manager of the Kansas City, Mexico & Orient Railway of Texas, with office at Sweetwater, Tex., succeeding O. G. Burrows, resigned.

E. O. Denny has been appointed traveling freight agent of the Nashville, Chattanooga & St. Louis, with headquarters at Memphis, Tenn., succeeding Walter C. Young, resigned.

F. T. Rennie, assistant general freight agent of the Mallory Steamship Company at Galveston, Tex., has been appointed general agent, with office at Galveston, in charge of all the lines in Texas.

J. W. Orr has been appointed traveling passenger agent of the International & Great Northern, with headquarters at Houston, Tex., succeeding Garland Tobin, resigned over two months ago to go with another company.

C. E. Dempsey, westbound contracting agent of the New York, Chicago & St. Louis at Omaha, Neb., has been appointed traveling freight agent, with office at Omaha, succeeding J. E. Hanson, and A. N. Hanson succeeds Mr. Dempsey.

C. S. Franklin has been appointed traveling freight agent of the Atchison, Topeka & Santa Fe, with office at Cincinnati, Ohio, succeeding E. P. Fisher, who, with the same title, and with headquarters at the same place, succeeds L. L. Korn.

George W. Sargent, commercial agent of the Mobile & Ohio at Chicago, has been appointed general agent, with office at Minneapolis, Minn., a new position. A. S. Birchett, soliciting freight agent at St. Louis, Mo., succeeds Mr. Sargent, and W. M. Penick, soliciting freight agent at Chicago, has been appointed traveling freight agent at the same place, a new office.

D. R. Gray, district freight and passenger agent of the Oregon Short Line and the Union Pacific at Salt Lake City, Utah, has been appointed assistant general freight agent, with office at Salt Lake City, succeeding F. H. Plaisted, promoted. H. E. Godwin, contracting freight agent at Salt Lake City, has been appointed district freight agent, succeeding to part of the duties of Mr. Gray, and L. J. Kyes has been appointed district passenger agent, also succeeding Mr. Gray. E. J. Hanson succeeds Mr. Godwin.

R. J. Southworth has been appointed traveling passenger agent of the Lake Shore & Michigan Southern and the Cleveland, Cincinnati, Chicago & St. Louis, with headquarters at Cleveland,

Ohio, succeeding W. R. Lynch, resigned. S. N. Behenna has been appointed traveling passenger agent of the C. C. C. & St. L., at Cincinnati, Ohio, succeeding C. B. Munyan, who has been appointed city passenger agent in place of Ernest R. Whelan, promoted.

Engineering and Rolling Stock Officers.

Charles C. Leech, foreman of the Pennsylvania Railroad shops at Buffalo, N. Y., has resigned to become general manager of the American Roller Bearing Company, Pittsburgh, Pa.

The offices of G. P. Miller, principal assistant engineer, and D. M. Perine, superintendent of motive power of the New Jersey division of the Pennsylvania Railroad, have been transferred from Jersey City, N. J., to the Pennsylvania station, New York.

D. W. Lum, who resigned about a year ago as chief engineer of maintenance of way and structures of the Southern Railway and the Northern Alabama Railroad, has been appointed consulting engineer of the Norfolk Southern, with office at Norfolk, Va.

T. Keaveny, roadmaster of the First Washington district of the Oregon-Washington Railroad & Navigation Company at Walla Walla, Wash., has been appointed roadmaster of the Third Washington district, with headquarters at Tekoa, Wash., succeeding F. W. Schultz, and D. O'Toole succeeds Mr. Keaveny.

George F. Tapp, assistant roadmaster of the Eastern division of the Texas & Pacific at Marshall, Tex., has been appointed assistant roadmaster of the Trans-Continental division, with headquarters at Bonham, Tex., and H. R. Merriwether, assistant roadmaster of the Louisiana division at Shreveport, La., succeeds Mr. Tapp. W. A. Brown succeeds Mr. Merriwether.

F. H. Hanson, division general foreman of the Lake Shore & Michigan Southern and the Lake Erie, Alliance & Wheeling at Collinwood, Ohio, has been appointed supervisor of materials of those lines, the Chicago, Indiana & Southern, the Lake Erie & Western, and the Indiana Harbor Belt, with office at Cleveland, Ohio, succeeding J. W. Senger, promoted. W. D. Mooney, foreman in the car department of the Lake Shore at Nottingham, Ohio, succeeds Mr. Hanson, and S. Lindman succeeds Mr. Mooney.

OBITUARY.

Edwin Hawley, chairman of the board of the Missouri, Kansas & Texas, Minneapolis & St. Louis, and vice-president of the Chicago & Alton, died suddenly on February 1.

W. F. Buck, superintendent of motive power of the Atchison, Topeka & Santa Fe, with office at Chicago, died early Wednesday morning, while being brought in a special train to Los Angeles,



W. F. Buck.

Cal., from a hospital at Albuquerque, where he had been ill with tonsillitis. Mr. Buck entered railway service as a machinist on the Northern Pacific. In 1893 he was made shop foreman on that road, and two years later general foreman of shops at Missoula, Mont. In 1899 he was transferred, with the same title, to Helena, Mont., and three years later was made master mechanic of the Rocky Mountain division. In 1904 he went to the Atchison, Topeka & Santa Fe as master mechanic at Needles, Cal. He was made mechanical superintendent of the Eastern Grand division of the same road in April, 1906, and was promoted to superintendent of motive power in January, 1908, with office at Chicago.

Equipment and Supplies.

LOCOMOTIVE BUILDING.

THE WABASH receivers have been authorized by the court to buy 25 locomotives.

THE ILLINOIS CENTRAL is having 7 Forney suburban engines rebuilt by the Lima Locomotive & Machine Company.

THE BARBER ASPHALT PAVING COMPANY, Philadelphia, Pa., has ordered one four-wheel switching locomotive from the Baldwin Locomotive Works.

THE CHICAGO, MILWAUKEE & ST. PAUL, it is said, will build 125 locomotives at the Milwaukee shops, and will order 10 locomotives. This item has not been confirmed.

THE GRAND TRUNK PACIFIC has ordered 25 consolidation locomotives from the Montreal Locomotive Works, and 15 consolidation locomotives from the Canadian Locomotive Company.

THE LOWVILLE & BEAVER RIVER has ordered one 10-wheel locomotive from the American Locomotive Company. The cylinders will be 18 in. x 26 in., the diameter of the driving wheels will be 50 in., and the total weight in working order will be 124,000 lbs.

THE BUFFALO CREEK has ordered four six-wheel switching locomotives from the American Locomotive Company. The cylinders will be 20 in. x 24 in., the diameter of the driving wheels will be 51 in., and the total weight in working order will be 144,000 lbs.

THE CATSKILL MOUNTAIN RAILWAY has ordered one eight-wheel passenger locomotive from the American Locomotive Company. The cylinders will be 13 in. x 18 in., the diameter of the driving wheels will be 49 in., and the total weight in working order will be 57,000 lbs.

THE CANADIAN PACIFIC is said to have ordered from its own shops 10 switching locomotives and 10 mikado locomotives, in addition to the 25 switching locomotives mentioned in the *Railway Age Gazette* of January 26. This is not yet confirmed. The 50 ten-wheel locomotives mentioned in our issue of last week as having been ordered from the company's shops, were instead ordered from the American Locomotive Company, making 83 locomotives in all ordered from the American Locomotive Company.

CAR BUILDING.

THE NORTHERN PACIFIC is in the market for 50 tank cars.

THE ULSTER & DELAWARE is in the market for 3 baggage and mail cars.

SWIFT & COMPANY, Chicago, have ordered 500 steel underframes from the Whipple Car Company.

THE ROCK ISLAND LINES are in the market for 20 combination passenger and baggage cars, 10 combination baggage and express cars, and 10 postal cars.

THE BALTIMORE & OHIO is not making inquiries for 36 passenger cars, as was mentioned in the *Railway Age Gazette* of January 12.

THE CHICAGO & NORTH WESTERN is said to have ordered 550 all-steel hopper cars from the Western Steel Car & Foundry Company. This item has not been confirmed.

THE NORTHERN PACIFIC has finally confirmed the order for 500 gondola cars from the Pressed Steel Car Company, reports regarding which have been circulating for some time.

THE BUFFALO, ROCHESTER & PITTSBURGH has ordered 17 all-steel passenger cars from the Pullman Company. These consist of four coaches, with seating capacity for 84 passengers; five combination passenger and smoking cars, with seating capacity for 82 passengers; five baggage cars; and three combination baggage and mail cars. All cars will be 66 ft. long over end framing; they will be of steel construction throughout and will have Commonwealth platforms and body bolsters and six-wheel trucks.

THE GREAT NORTHERN, mentioned in the *Railway Age Gazette* of December 29 as having ordered 1,500 refrigerator cars from

the Haskell & Barker Car Company, only ordered 750 refrigerator cars from that company at that time. These cars will have a capacity of 60,000 lbs. and will weigh 42,700 lbs. The inside measurements will be 39 ft. 1 in. long; 8 ft. 1½ in. wide, and 7 ft. 4¾ in. high. The over all measurements will be 40 ft. long; 9 ft. 3 in. wide, and 12 ft. 4 in. high. Both the bodies and the underframes will be of wood. The cars will be fitted with New York air brakes, Aurora brasses and Sharon couplers.

THE GRAND TRUNK has ordered the 500 refrigerator cars and 500 automobile cars mentioned in the *Railway Age Gazette* of January 12. All cars will be 40 ft. long, of 30 tons capacity, and delivery is to begin in April. The order is divided as follows: 250 refrigerators from the Canadian Car & Foundry Company; 250 refrigerators from the American Car & Foundry Company; 250 automobile steel underframe cars from the American Car & Foundry Company, and 250 automobile steel underframe cars from the Western Steel Car & Foundry Company. The company is now in the market for 300 30-ton wood underframe flat cars, and 300 30-ton steel underframe flat cars.

IRON AND STEEL.

THE SOUTHERN NEW ENGLAND has ordered 6,500 tons of bridge steel from the American Bridge Company.

THE DELAWARE & HUDSON has ordered 5,000 tons of bridge material from the American Bridge Company.

THE ERIE has ordered 35,000 tons of rails, of which the majority will be rolled by the United States Steel Corporation.

THE GRAND TRUNK is said to have ordered 10,000 tons of rails from the Illinois Steel Company. This item has not been confirmed.

THE CHICAGO & NORTH WESTERN has ordered 845 tons of bridge material, dividing the order between the King Bridge Company, the Fort Pitt Bridge & Iron Works, the Wisconsin Bridge & Iron Company, and the Morave Construction Company.

THE PENNSYLVANIA RAILROAD is said to have placed an order for 150,000 tons of rails. It is understood that the Cambria Steel Company and the Pennsylvania Steel Company will receive the great majority of this order, and that the Steel Corporation will receive the balance. This item has not been confirmed.

GENERAL CONDITIONS IN STEEL.—There has been but little change in the steel industry during the past week. The Steel Corporation continues to operate at about 90 per cent. of its capacity. Orders for new business are not as good at present as during December, but prices are better and the unfilled tonnage for this month is expected to show an increase. Prices have remained firm, and there is no prospect of an immediate change. Rail orders during January have been heavy and some large orders are still pending. An improvement in the volume of new business received is expected during the next two months.

In December, 1911, the Italian government granted a concession to the Societa L'Ausiliare di Milano for building a 30-mile railway between the cities of Arezzo and Sinalunga, both in the department of Tuscany. The concession is for 50 years, and carries a government subsidy of \$2,162 per mile. The estimated cost of the new line is \$1,254,500. The work is to be started as soon as possible and it is planned to have the road completed by the middle of 1914. The track is to be standard gage to correspond with the connecting lines. No particular engineering difficulties are encountered along the right of way. Starting from Arezzo the line will pass through the villages of Civitella, Monte Sansovino, Marciano, Lucignano, and Foiano. It will also traverse the entire length of the fertile Chiana valley. At Sinalunga it will connect with the Siena Railroad. This new road will facilitate travel between Florence and Siena by way of Arezzo, which will be a great accommodation to tourists visiting those cities. By the Arezzo-Sinalunga railway the distance between Arezzo and Sinalunga will be shortened 34 miles. An extension of this road from Sinalunga to Tequanda S. Giovanni d'Asso, which would further shorten the distance between Arezzo and Grosseto by 14 miles, is also talked of. This extension would connect Arezzo and the Appennine districts lying to the north of Arezzo with Grosseto, and also afford a direct line of communication between eastern Tuscany and the ports of S. Stefano and Talamone on the Mediterranean.

Supply Trade News.

James B. Brady has been elected vice-president of Manning, Maxwell & Moore, New York, succeeding W. O. Jacquette.

George C. Isbester, vice-president of the Q. & C. Company, Chicago, resigned on February 1, to engage in other business.

The general offices of the George M. Newhall Engineering Company have been moved to 1421 Chestnut street, Philadelphia, Pa.

Charles C. Leech, shop foreman of the Pennsylvania Railroad at Buffalo, N. Y., has resigned to become general manager of the American Roller Bearing Company, Pittsburgh, Pa.

F. M. Gilmore, formerly with the railway department of the H. W. Johns-Manville Company, New York, has taken a position with the Chicago Car Heating Company, with headquarters in the Railway Exchange Building, Chicago.

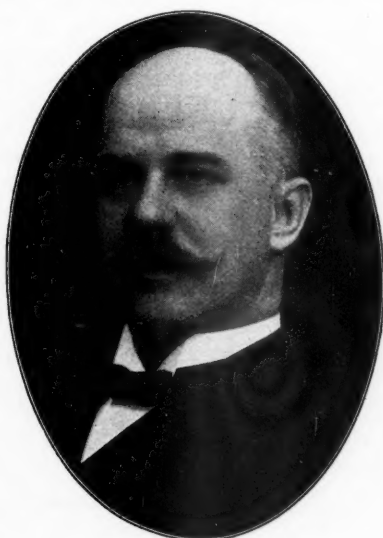
J. Warren Young, chief signal inspector of the Erie, has resigned to go to the Kerite Insulated Wire & Cable Company, New York. Mr. Young has been engaged in signal work since 1896 on the Central of New Jersey, the Delaware, Lackawanna & Western, the New York, Susquehanna & Western, and the Erie successively.

The Curtain Supply Company, Chicago, has received an order for ring curtain fixtures and Rex all-metal rollers for 550 cars being built by the J. G. Brill Company for the Philadelphia Rapid Transit Company; also an order for the same kind of fixtures and rollers for 100 cars being built by the same company for the Buffalo steel railways.

A voluntary petition in bankruptcy has been filed in the United States district court at Cincinnati, Ohio, by the Cincinnati Equipment Company, dealer in second-hand railway and contractors' supplies. The petition gives the liabilities of the company as \$407,513 and its assets as \$135,288. The largest unsecured creditor is the Isaac Joseph Iron Company, with claims of \$44,771.

E. H. Baker, whose election to the second vice-presidency of the Galena-Signal Oil Company, Franklin, Pa., was mentioned in the *Railway Age Gazette* of January 19, was born on March 4, 1853, in Brooklyn, N. Y. He finished his schooling in the Polytechnic Institute of Brooklyn in 1870, and in the same year started in the oil business with S. T. Baker & Co., New York, his father's firm, which was established in 1849. Mr. Baker began at the bottom and in 1873 was given an interest in the company. In 1886 his father retired from the business, the firm name remaining the same, with E. H. Baker and F. B. Baker as partners. In 1894 E. H. Baker entered the sales department of the Galena company, with office in New York, which position he has held until his recent appointment to the second vice-presidency of that company.

Isaac A. Sweigard, vice-president of the Johnston Railroad Frog & Switch Company, Chester, Pa., and formerly for 14 years general superintendent of the Philadelphia & Reading, died on January 24 at St. Lucie, Fla. Mr. Sweigard was born on July 23, 1843, in Dauphin county, Pa., and began railway work August 1, 1864, on the Reading at Dauphin. From May, 1865, to February, 1871, he was agent of the Reading at Pine Grove, and then for two years was train despatcher. On April 1, 1873, he was appointed superintendent of the Northern Pennsylvania and Bound Brook division and the Germantown and the Norristown



E. H. Baker.

branches, and from December, 1886, to March, 1892, he was general superintendent of the entire system. He was appointed assistant general manager in March, 1892, and the following August was made general manager. From June, 1893, to September, 1900, he was general superintendent of the main line division of the same system. In December, 1900, he left the road and went to the Johnston Railroad Frog & Switch Company. He was also interested in promoting electric railway lines in Pennsylvania and New Jersey.

Proposed Location of Western Plant of Baldwin Locomotive Works.

Considerable interest is attached to the proposed location of a western plant of the Baldwin Locomotive Works, Philadelphia, Pa., which recently bought land in the Chicago district near the great manufacturing plants in the vicinity of Gary, Ind. The Baldwin tract covers 370 acres, triangular in shape, with its eastern boundary on the line dividing the corporate limits of East Chicago and Gary. On the south line are the Elgin, Joliet & Eastern Railway, and the Chicago, Lake Shore & South Bend electric. On the north is the joint right-of-way of the Pennsylvania and the Baltimore & Ohio Chicago Terminal. The Pennsylvania is a switching track which connects with the main line of the Pittsburgh, Fort Wayne & Chicago a short distance east at Clark Junction. The property is well provided with transportation facilities and has the advantage of the electric line for workmen living in the vicinity.

S. M. Vauclain, vice-president of the Baldwin Locomotive Works, explains that when business conditions warrant it is the intention to start with the erection of a power house, foundry and forges for the manufacture of castings and forgings sufficient for ten locomotives of the largest type per week. When this portion of the plant is finished and in working order, the finishing departments, machine and erecting shops of proper size for ten locomotives a week will be erected and put in operation. Such a plant should furnish employment to about 5,000 men. It is regarded as one unit, and the completed plans should provide for three such units with an output of 30 locomotives a week.

Some of the principal manufacturing plants in the vicinity of the tract are: to the north, about 1½ miles, the American Steel Foundries, the Standard Forging Company, and the Midland Steel Company; to the northeast, one mile, the Universal Cement Company, and to the northwest one mile, the Buckeye Steel Castings Company. Three miles to the southeast is the new plant of the American Bridge Company, and adjoining it, to the east, the large tract owned by the American Car & Foundry Company. Five miles east by south is the large plant of the Indiana Steel Company at Gary, and seven miles to the southeast, within the corporate limits of Gary, is the tract bought by the American Locomotive Company.

TRADE PUBLICATIONS.

VALVES.—The National Tube Company, Pittsburgh, Pa., has recently issued bulletin No. 7 on its regrinding valve, in which this valve is fully illustrated and the method of regrinding the valve seat is given.

RADIATORS.—The United States Radiator Company, Detroit, Mich., has issued the December number of *Radiation*, a magazine published occasionally, devoted to the interests of the hot water and steam heating industry.

METALLIC HOSE.—The American Metal Hose Company, Waterbury, Conn., has published a small illustrated folder on flexible metal hose for steam, oil, gas, suction, air or conduit, in which dimensions and prices are given.

EAVE TROUGH HANGERS.—The Crescent Specialty Company, Rochester, N. Y., has published a small folder on Crescent galvanized channel steel eave trough hangers, which tells of their simple construction and many advantages.

LIGHTING.—Bulletin No. 4907 of the General Electric Company, Schenectady, N. Y., gives data relative to the lighting of buildings by G. E. Edison Mazda lamps. Illustrations of numerous buildings lighted with these lamps are shown.

ELECTRIC FANS.—The General Electric Company, Schenectady, N. Y., has published a very full catalog of its electric fans for

ceilings, walls and desks. The catalog is illustrated and gives a list of supply parts for the fans and their prices.

NORFOLK SOUTHERN.—The passenger department of this company has published a folder on hunting and fishing, giving game laws, a list of the guides, and information on where to go for the best sport in Virginia and North Carolina.

FURNACES.—Tate, Jones & Co., Inc., Pittsburgh, Pa., has published a very attractive 30-page catalog of its furnaces for heating, forging and welding. The catalog is well illustrated and gives full descriptions and dimension tables.

RECORDING INSTRUMENTS.—The Uehling Instrument Company, Passaic, N. J., has recently issued bulletin No. 2, which is a condensed catalog of its recording instruments. The bulletin contains illustrations of pressure, vacuum, draft, revolutions and CO₂ recorders.

FEED HAMMER DRILLS.—The Ingersoll-Rand Company, New York, has published form No. 4016 on Imperial valveless, telescope, feed hammer drills, giving detailed descriptions supplemented by illustrations and diagrams. Dimension and price tables are also included.

THOR TOOLS.—The Independent Pneumatic Tool Company, Chicago, has published a small illustrated folder giving the advantages and the dimensions of the various Thor pneumatic tools, including piston air drills, pneumatic hammers, staybolt drivers, air appliances, etc.

CONCRETE POSTS.—The D. & A. Post Mold Company, Three Rivers, Mich., has published a 30-page pamphlet on Concrete Posts and How to Make Them, in which it tells of the durability and other advantages of these posts and describes the molds for their manufacture made by this company.

LOCOMOTIVE ACCESSORIES.—The Locomotive Improvement Company, Clinton, Ohio, has issued catalog No. 2, describing Markel's removable driving box brasses, lateral motion plates, flangeless shoes and wedges and solid head main rods. The recent improvements in these articles are included in the pamphlet.

SAN PEDRO, LOS ANGELES & SALT LAKE.—This company has published an unusually attractive booklet entitled The New High Line, describing the line which runs through the Meadow Valley Wash, in southeastern Nevada. The booklet includes many exceptionally well colored photographs of the scenes along this line.

SHOP HEATING.—The American Blower Company, Detroit, Mich., has published a 30-page illustrated booklet on shop heating, containing a treatise and some practical suggestions by F. R. Still; also, some good illustrations of typical heating and ventilating systems designed and installed by the American company.

VENTILATORS AND DOOR CLOSERS.—Burton W. Mudge & Company, Chicago, have issued two illustrated folders, one describing the Garland ventilator for passenger cars, which is now in use on about 6,000 cars of the Pullman Company, the other describing the Garland door closing and opening device for refrigerator cars.

PENNSYLVANIA RAILROAD.—The industrial department of this company has published a useful 50-page booklet on Farming Possibilities of the Delaware-Maryland-Virginia-Peninsula, describing the great productivity and the resources of this region and telling of the work of this company in establishing experimental farms.

CARBONIZING COATING.—The Goheen Manufacturing Company, Canton, Ohio, has published a very attractive pamphlet on carbonizing coating for preserving iron and steel construction. The pamphlet includes illustrations of many well-known structures on which this product has been used. Carbonizing coating is a protective paint and is applied in the same manner as other paints.

CHESAPEAKE & OHIO.—The industrial department of this company has published a very full illustrated booklet on industrial sites along the lines of the C. & O. The booklet describes the markets and shipping facilities, the various industries, also the water power, the climate and the labor conditions. Facts for the manufacturer, the merchant and the workman are also included.

GRINDING WHEEL SAFETY.—The Norton Company, Worcester, Mass., has published an interesting booklet entitled Safety as Applied to Grinding Wheels, describing modern preventive and protective safeguards which can be easily applied in the use of grinding wheels and machines. The booklet contains photographs and diagrams which serve to amplify the descriptions of these devices.

NORTHERN PACIFIC.—The traffic department of this company has published two folders on Oregon, one called Oregon for the Home-Seeker, the other called Central Oregon, describing the great advantages that are to be found in this region, including the fertility of the soil and the diversity of resources. The booklets also give many facts on the climate, the population and the opportunities offered.

COMPRESSORS.—The Chicago Pneumatic Tool Company, Chicago, has published bulletins Nos. 34 A, 34 C, 34 E and 34 H on the different types of compressors, both steam driven and gasoline driven, made by this company. The bulletins are illustrated, and include detailed descriptions and diagrams. Bulletin No. 34 H is devoted to general instructions for installing and operating Chicago pneumatic compressors.

NEW YORK CENTRAL & HUDSON RIVER.—The farm bureau of this company has published a small illustrated booklet entitled America's Greatest Farming State, New York, in which some interesting figures are given of the crops and other farm products of that state. The booklet goes on to tell of what this road has done for the farmer and ends with brief comments on suburban homes on the New York Central Lines.

SECTIONAL CONDUIT.—The H. W. Johns-Manville Company, New York, has published a 45-page illustrated booklet on J-M sectional conduit for steam and hot water lines. The booklet tells of the success this underground pipe covering system has met with and gives specifications and methods of determining the size of conduit required. Maps of the various installations in the country are included to show the large area that may be heated by this system.

BRAKE SHOES.—The Allen & Morrison Brake Shoe & Manufacturing Company, Chicago, has issued an illustrated catalog describing the advantages of the Acme steel-back, locomotive-driver, brake shoe. The principal feature is the tire dressing obtained by hard metal inserts triangular in form and presenting an inclined shearing edge across the face of the shoe. The Acme brake shoe is made with a patented steel back extending over the whole length of the shoe. A full report of tests of this shoe in various classes of service, with illustrations showing the comparative tire wear, is included in the catalog.

FOREIGN RAILWAY NOTES.

Arthur Griffith, minister of public works of New South Wales, turned the first sod of the Glenreigh to Coff's Harbor railway line on November 25.

The report of the public works committee of New South Wales on the proposed railway from Galong to Burrowa has been tabled in the legislative assembly. The committee recommends the construction of a line about 17 miles long, at an estimated cost of \$408,370, an average of \$22,940 per mile. It is expected that for a time an annual loss of \$15,130 will result from the operation of the line, based on a tri-weekly train service.

The total cost of building the proposed transcontinental railway through southern and western Australia, from Port Augusta to Kalgoorlie, is estimated by the Commonwealth consulting railway engineer to be \$19,680,000; including bridges and culverts, \$408,000; rails and fastenings, \$4,925,000; ties and ballast, \$5,050,000; water supply, \$2,219,000; station yards, including telegraph equipment, terminal accommodation and workshops and machinery, \$1,630,000; rolling stock, \$1,582,000, etc. If internal combustion locomotives were employed, the cost would be reduced \$1,864,000, owing to the saving to a large extent of the cost of providing water. It is recommended that an extension of the same gage as the transcontinental railway be built from Port Augusta southward to Brinkworth, a distance of 96 miles, at a cost of not more than \$1,460,000. This would effect a saving in distance between Port Augusta and Adelaide of 58 miles.

Railway Construction.

New Incorporations, Surveys, Etc.

ALABAMA ROADS.—Grading work is now under way on a 6-mile line from Fayette, Ala., south along Slippery river. The line is to be extended to a point about 35 miles from Fayette. Lee Baskett is building the line to reach timber lands. Woodson Hopkins is the engineer in charge, Henderson, Ky.

ALTUS, ROSWELL & EL PASO.—The rights and property of this company have been bought it is said by W. W. West, of Houston, Tex. The plans call for building from Altus, Okla., southwest via Memphis, Tex., and Lubbock, thence via Roswell, N. M., to El Paso, Tex. Construction is now under way between Memphis and Lubbock, and it is announced that the section between these places, about 110 miles, will be finished and placed in operation within the next few months.

ASHERTON & GULF.—The rights and property of this company operating a 32-mile line from Asherton, Tex., to Artesia Wells have been sold, it is said, to an English syndicate, represented by Edward Cowperthwaite, London, Eng. It is understood that the new owners will build an extension from Asherton, northwest via Eagle Pass to Del Rio, about 150 miles, and will also build from Artesia Wells northeast to Crowther, about 60 miles. R. S. Gresham, chief engineer, Asherton.

BANGOR & AROOSTOOK.—According to press reports, this company is making surveys for a 10-mile line from Caribou, Me., west to Washburn and Perham. M. Burpee, chief engineer, Houlton, Me.

BEAVER, MEADE & ENGELWOOD.—Incorporated in Oklahoma with \$25,000 capital to build a line to connect Beaver, Okla., Meade, Kan., and Engelwood, about 70 miles. The incorporators include F. C. Tracy, E. Clift, J. W. Webb and F. Laughrin, all of Beaver.

CANADIAN PACIFIC.—See New Brunswick Coal & Railway.

CANADIAN ROADS.—A company has been organized in Canada to build a line from Hull, Que., northwest to James Bay, about 500 miles. A. N. Laredo, London, is said to be back of the project, and J. W. Paton is chief engineer.

CHICAGO, BURLINGTON & QUINCY.—According to press reports, work on the Hudson-Greely cut-off in Colorado will probably be started this coming summer. It is expected that track laying will be carried out on the grade already finished between Thermopolis, Wyo., and the Powder river this year. F. T. Darrow, engineer maintenance of way, Lincoln, Neb.

CHICAGO & WABASH VALLEY.—According to press reports, this company, which operates a line from McCoysburg, Ind., to Dinwiddie, 32 miles, is planning to build an extension to complete a short line from the Gary steel mills to the Indiana coal fields. The present northern terminus of the line is 16 miles southwest of Gary. C. J. Hobbs, chief engineer, Kersey.

CRYSTAL CITY & UVALDE.—An officer is quoted as saying that an extension will be built from Fowler, Tex., the present eastern terminus to Port Aransas on the Gulf of Mexico, about 125 miles. E. Breaker, chief engineer, Crystal City.

FAIRCHILD & NORTH EASTERN.—An officer writes that contracts are to be let about March 1, to build an extension from the present western terminus at Fairchild, Wis., west to Caryville on the Chicago, Milwaukee & St. Paul, about 40 miles. Maximum grades will be 2 per cent., maximum curvature 4 deg. There will be one 36-ft. steel bridge. Willard Foster, chief engineer, Fairchild.

GLENMORA & WESTERN.—Organized with \$200,000 capital, it is said, to build from Glenmora, La., northwest to Shreveport, thence west of that place, also to build southeast from Glenmora to New Orleans. N. M. Cady, president; S. Lisso, vice-president, and B. E. Smith, treasurer.

GREAT NORTHERN.—According to press reports a large amount of terminal improvements are to be carried out in Winnipeg, Man. This includes building large freight sheds and yards. A. H. Hogeland, chief engineer, St. Paul, Minn.

HUDSON BAY RAILWAY.—The original plans of this company have been adopted, it is said, to build from Pass Mission, Keewatin, to Port Nelson on Hudson Bay. A contract for the work has been let to J. D. McArthur, Winnipeg, Man., and it is said that construction work will be started soon.

KANSAS CITY, CLAY COUNTY & ST. JOSEPH.—This company has increased its capital stock from \$720,000 to \$10,000,000. The company was incorporated March 22, 1911, by Kansas City and Chicago capitalists, to build a 72-mile line from Kansas City, Mo., north through Clay, Platte and Buchanan counties to St. Joseph. C. M. Hammond, president.

KANSAS CITY & MEMPHIS.—An officer writes that a contract has been given to the W. R. Felker Construction Company for work on the extension southeast via Fayetteville, Ark. Track has already been laid on 14 miles. M. Hays, chief engineer, Rogers. (November 17, p. 1037.)

LAKE ERIE & NORTHERN (Electric).—This company, with headquarters at Brantford, Ont., has secured a right of way, and will begin construction work soon between Brantford and Port Dover. The city of Brantford has granted the company rights for a new entrance into the city with a terminus at the old Great Western Railway station.

LITTLE FALLS & JOHNSTOWN.—Application has been made to the New York Public Service Commission, Second district, for a certificate of convenience and necessity to build from Johnstown, N. Y., west via Ephratah, Palatine, St. Johnsville and Manheim to Little Falls in Herkimer county, about 28 miles, with an 8-mile extension through St. Johnsville, Palatine, Nelliston, Fort Plain and Minden to Canajoharies in Montgomery county.

MAINE CENTRAL.—An officer of the Rangeley Lakes & Megantic writes that contracts will probably be let February 15, for construction work on about 11 miles from Oquossoc, Me., north along the east shore of the Kennebec river to Kennebec. The work involves excavating about 18,000 cu. yds. a mile and the construction of 18,000 cu. yds. of embankment a mile. Maximum grades will be 1 per cent. compensated, and maximum curvature will be 3 deg. 10 min. There will be one steel bridge, 25 ft. long, also a station building, engine house, coal shed and water tank. The line is being built to carry wood, logs and timber. M. McDonald, president; T. L. Dunn, chief engineer, Portland, Me. (January 19, p. 182.)

Work is now under way by Trites & Sargent, Bangor, Me., building a 2-mile extension of the Hartland branch from Mainstream, Me., to Harmony. T. L. Dunn, chief engineer, Portland, Me. (November 17, p. 1037.)

NEW BRUNSWICK COAL & RAILWAY.—This company, which operates 58 miles of road from Norton, N. B., to Minto, it is said, has arranged to build an extension west to Gibson, about 30 miles. The line is to be operated by the Canadian Pacific. The provincial government will guarantee bonds to the extent of \$15,000 a mile, and it is understood that the dominion government has promised an additional grant of \$6,400 a mile. A. Sherwood, manager, Norton.

NEW YORK SUBWAYS.—A contract has been given to the Degnon Construction Company, New York, at \$2,335,830, for building section No. 2 of the Broadway subway, including a station at City Hall. The section extends from Park Place to Walker street, in the Borough of Manhattan, and connects with section No. 3, contract for which was recently let to the Underpinning & Foundation Company. (January 26, p. 176.)

NORFOLK SOUTHERN.—This company is said to have made surveys for an extension from Beaufort, N. C., to Cape Lookout, about 8 miles. F. L. Nicholson, chief engineer, Norfolk.

ORANGE & NORTHWESTERN.—See St. Louis & San Francisco.

RANGELEY LAKES & MEGANTIC.—See Maine Central.

ST. LOUIS & SAN FRANCISCO.—According to press reports the Orange & Northwestern is to be extended north to a connection with the Marshall & East Texas at Elysian Fields, Tex., about 125 miles. This work is to be carried out during the present year. F. G. Jonah, chief engineer of construction, St. Louis, Mo.

SANDY VALLEY & ELKHORN.—An officer writes that this company is building from Shelby, Ky., south to Jenkins, about 30 miles, through a coal section belonging to the Consolidated Coal Company, in Letcher, Pine and Knott counties. The road is nearing completion and the company expects to begin the operation of trains about April 1, of this year. J. H. Wheelwright, president, Baltimore, Md.

SOUTHWESTERN TRACTION & POWER COMPANY.—A contract is said to have been let to build from Jeanerette, La., northwest to a point beyond New Iberia. The work is to be started at once. The Chatham Construction Company has the contract to build the line, of which A. F. Jacobs is president; F. W. Crosby, second vice-president and general manager. The directors include J. Godchaux and A. G. Barrows, New Orleans.

WENATCHEE VALLEY (Electric).—This company has secured funds, it is said, and will soon start work on an interurban electric line from Malaga, Wash., northwest via Wenatchee to Leavenworth, about 40 miles. E. J. Felt, Wenatchee, is said to be interested.

RAILWAY STRUCTURES.

ADA, OKLA.—The St. Louis & San Francisco proposes to build a new passenger station.

BEAUMONT, TEX.—The Texas & New Orleans will shortly begin the erection of a new roundhouse.

CHAPMAN, ALA.—The Louisville & Nashville will put up a new station, it is said, at Chapman.

CHEHALIS, WASH.—The Northern Pacific has selected a site for a new brick passenger station, which, it is reported, will cost \$50,000.

DEQUINCEY, LA.—It is reported that the Kansas City Southern will build a new roundhouse and shops.

KINGSVILLE, TEX.—The St. Louis, Brownsville & Mexico has let the contract for a new tourist hotel and a new passenger station. Work is now in progress on the enlargement of the shops at this point.

LAREDO, TEX.—The International & Great Northern is building a new \$35,000 passenger station.

OMAHA, NEB.—The Chicago, Rock Island & Pacific, and Union Pacific will reconstruct a viaduct at Eleventh street.

PERRY, IA.—The Chicago, Milwaukee & St. Paul proposes to enlarge its roundhouse and install a mechanical coaling station.

SAN DIEGO, CAL.—It is reported that the Atchison, Topeka & Santa Fe will shortly begin the construction of a reinforced concrete freight shed.

TUCSON, ARIZ.—Plans have been prepared by the El Paso & Southwestern for an 8-track yard, roundhouse, repair shops, freight warehouse, office building and passenger station.

WINNIPEG, MAN.—See Great Northern under Railway Construction.

YARDLEY, WASH.—Improvements to be made by the Northern Pacific this year in connection with its separation of grades through the business portion of Spokane, include the erection of a roundhouse, turntable, engine room, machine shop, storehouse, office, car shop, ice house and two coal decks.

FOREIGN RAILWAY NOTES.

For the development of the interior of Sicily, the Italian government has decided in principle to grant subsidies for secondary railways of 3 ft. 3 in. gage to the extent of from \$2,470 to \$2,998 per mile a year. The length contemplated of these secondary lines is approximately 497 miles.

Authority has been given by the railway commissioners of Victoria for the provision of additional siding accommodation between Newport and North Williamstown in order to facilitate the handling of grain traffic. The work to be carried out will involve an expenditure of about \$7,500.

Railway Financial News.

ARKANSAS, OKLAHOMA & WESTERN.—This company, whose property was taken over by the Kansas City & Memphis, is to distribute to its stockholders Kansas City & Memphis stock at the ratio of five-eighths of a share of K. C. & M. stock for each share of A. O. & W. stock held. The stockholders are to vote on February 13, 1912, on the question of dissolving the old A. O. & W.

ASHERTON & GULF.—A press report says that control of this line which runs from Asherton, Texas, to Artesian Wells, 32 miles, has been bought by English capitalists.

CANADIAN PACIFIC.—This company has taken over the Alberta Central.

CHICAGO, MILWAUKEE & ST. PAUL.—Directors have declared a semi-annual dividend of 2½ per cent. on the common stock, thus reducing the dividend on the common stock from an annual rate of 7 per cent. to an annual rate of 5 per cent. The 7 per cent. dividend in 1911 was shown as earned only by the inclusion in other income of a dividend on the St. Paul's Pacific coast extension subsidiary—the C. M. & P. S.—from the earnings of the two previous years. Current earnings of the St. Paul and the Puget Sound apparently did not show the 7 per cent. rate as being earned, so that if the 7 per cent. rate had been continued, as it is understood some of the directors were in favor of doing, surplus would have had to have been drawn on.

DELAWARE, LACKAWANNA & WESTERN.—Stockholders are to vote on February 20 on the question of increasing the capital stock from \$30,277,000 to \$42,277,000. The proceeds from the sale of the additional \$12,000,000 stock are to be used to pay for improvements to the line in the state of Pennsylvania. It is estimated that this work will cost \$15,000,000. Lackawanna stock has a par value of \$50 per share, but is, of course, quoted on the New York Stock Exchange on a per cent. basis, so that the price of 545-555, quoted for the end of last week, is the price of two \$50 shares.

MINNEAPOLIS & ST. LOUIS.—Stockholders of this company and of the Iowa Central have subscribed for between \$900,000 and \$950,000 of the new \$2,500,000 5 per cent. extension and refunding bonds of the Minneapolis & St. Louis, which were issued in connection with the taking over the Iowa Central by the Minneapolis & St. Louis. The underwriting syndicate, headed by J. S. Bache & Co., New York, have taken the remainder of the bonds, but are not at present making a public offering. The bonds were offered to stockholders with a bonus of five shares of preferred stock of the M. & St. L., and at the present market price of the M. & St. L. preferred stock, the bonds were offered to stockholders at about 70.

NATIONAL RAILWAYS OF MEXICO.—This company, whose earnings are not given in our tables of roads reporting to the Interstate Commerce Commission, earned gross in December, 1911, \$5,384,568, as against \$5,370,886 in December, 1910. Operating expenses in 1911 were \$2,892,202, and in 1910, \$3,143,655 leaving a net in 1911 of \$2,493,366, or \$265,135 more than in December, 1910. For the six months ending December 31, the National Railways of Mexico earned net \$14,797,311, an increase over the same period of 1910 of \$1,557,394.

WABASH.—Suit has been brought with the approval of the bondholders' protective committee, James N. Wallace, chairman, for foreclosure and sale of the property under the refunding mortgage. The United States district court at St. Louis has consolidated this suit with the original suit brought by the Westinghouse Air Brake Company for an \$18,000 debt, and the same receivers, namely, President F. A. Delano, W. K. Bixby and Vice-President Edward B. Pryor are continued as receivers under the consolidated suit. The receivers are authorized to spend \$8,306,816, and are authorized to issue receivers' certificates for amount spent in excess of the \$1,600,000 now on deposit with the Equitable Trust Co., New York. The Wallace committee, in a statement, are quoted as telling President Delano that there would, so far as necessary, finance the program of improvements to the physical property of the Wabash. There are \$41,921,000 of the first refunding and extension mortgage bonds outstanding.